THE OIL WEEKLY

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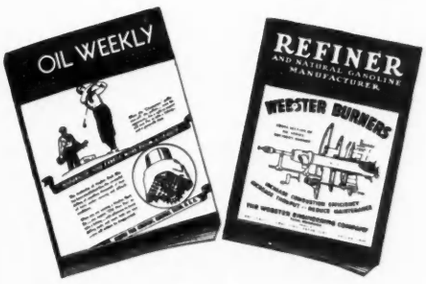

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The Oil Man's Calendar

MAR.	
15-17	**Society of Exploration Geophysicists, New Orleans.**
16-18	**American Association of Petroleum Geologists, New Orleans.**
21-25	**Western Metal Congress, Biltmore Hotel, Los Angeles.**
23-25	**American Society of Mechanical Engineers, Los Angeles, Calif.**
24-25	**Southwestern District, A.P.I., Spring Meeting, Fort Worth, Texas.**
APR.	
13-15	**Petroleum Industry Electrical Association, Rice Hotel, Houston.**
13-15	**National Petroleum Association, Cleveland, Ohio.**
14-15	**A.P.I., Eastern District, Division of Production, William Penn Hotel, Pittsburgh, Pennsylvania.**
19	**A.P.I., Division of Production, Pacific Coast District, Spring Meeting, Biltmore Hotel, Los Angeles.**
MAY	
6-12	**American Gas Association, Natural Gas Department, New Orleans, La.**
11-13	**Natural Gasoline Association of America, Hotel Tulsa, Tulsa.**
12-14	**National Oil Scouts Association of America, Tulsa, Oklahoma.**
14-21	**International Petroleum Exposition, Tulsa, Oklahoma.**
23-25	**A.P.I., Mid-Year Meeting Wichita, Kansas.**

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LOOKING AHEAD

WITH THE EDITOR

Index for Acid Treatability . . .
Seismic Geophysical Prospecting

ACIDIZING of cores is an important function today, but little data has been published that offers a practical means of rating treatability on a general, workable basis. Therefore, an article to appear in THE OIL WEEKLY February 28 will be of much value, as it is to offer an acidizing index method. This is a means to improve field service, as the best type of acid may be chosen, difficulties in treating may be recognized in advance, and some idea procured as to the amount of acid required to obtain the best results. We believe the index method to be presented in this article is one of the best indications of the adaptability of a formation to acid treatment. Considerable research has been conducted in developing the acidizing index method, the work of which is fully traced along with the results found. An abundant number of illustrations gives the article much additional value.

ALL oil men know of the seismic method of geophysical prospecting, but there are many who do not understand the field procedure followed. Some highly technical descriptions of such activities have been published, but there has never been a pictorial story of the procedure together with a layman's outline of the work. However, this is soon to be rectified, as an early issue will carry a picture story of a seismic crew performing its various duties.

THE interesting and comprehensive article on U. S. S. R. crude reserves, which starts in this issue, is to be continued. In the forthcoming installment, author David Wosk continues his discussion of the different producing and prospective areas in the Soviet.

The changing panorama

THE situation in the oil industry has shown some improvement lately. Tank car prices of gasoline are tending to rise, after having held steady for several weeks. And the crude oil market is firm, in consequence of the exceptionally strict control of production so far this year.

Similarly strict crude control is promised, moreover, for the next several months; after which seasonally expanding consumption may be expected to permit expansion of production and refinery activity.

Oil Reserves at New Peak

The petroleum industry has further demonstrated its efficiency, through its record of crude oil discoveries in the past year.

During 1937 the industry expanded known crude oil reserves to 15,507,268,000 barrels, the greatest amount on record, despite a heavy drain on the established fields within the year.

This estimate of known oil reserves as of January 1, 1938, was given out last week by the American Petroleum Institute's committee on reserves.

It was stated that this new estimate was 2,443,868,000 barrels higher than the similar estimate as of January 1, 1937.

In arriving at the 15,507,268,000-barrel estimate, the committee calculated possible recovery, by present methods, from all the established fields that have been developed sufficiently to permit practical calculation. Dealing only with known accumulations, the estimate does not embody allowance for possible reserves in untested areas.

Texas was credited with over half of the nation's known crude reserves at the beginning of this year, the estimate for the state having been 8,247,928,000 barrels. California was second, with 3,063,142,000 barrels, and Oklahoma third with 1,440,692,000 barrels. The Rocky Mountain States were estimated to have 399,839,000 barrels of recoverable oil and the Eastern States 536,082,000 barrels. The Central and Southern States, including Texas and Oklahoma, were credited with a total of 11,508,205,000 barrels.

Proposed Fuel Tax Opposed

The bill by Congressman Boland of Pennsylvania proposing to levy a 1-cent a gallon federal tax on fuel oil already has run into formidable opposition, despite the fact that it does not yet have the approval of the House Ways and Means Committee. Among those who have raised their voices in opposition was Col. Ernest O. Thompson, Chairman of the Interstate Oil Compact Commission and a member of the Texas Railroad Commission. Thompson pointed out, last week, in a letter to President Roosevelt, Vice President Garner, and members of Congress from Texas, that the measure was not a revenue raising or conservation measure, but a move to penalize the oil industry.

The author of the bill has described it as a measure to promote conservation of the nation's oil reserves and as one which would discourage the use of fuel oil for heating or similar purposes. And in support of the bill, he asserted that a scarcity of oil impends, offering as evidence a recent report on the nation's oil reserves presented recently at the conference of oil state governors at Hot Springs, Arkansas.

However, it is significant that Congressman Boland is from Scranton, Pennsylvania, and represents an anthracite coal-mining district. Consequently, opponents of the bill contend that the proposed tax is

Oil companies are taking an increased interest in the welfare of their employees, particularly in areas removed from the usual conveniences. A part of Continental Oil Company's main camp in the Tepetate, Louisiana, field is shown, with the office in the right foreground. This field is located several miles from towns that offer good living conditions, but modern cottages erected by the company have done much to solve the housing problem. Families accustomed to life in the oil fields appreciate the desirable quarters furnished by producing companies.

intended to react to the advantage of the coal miners, in their competition with sellers of fuel oil.

Aftermath of Madison Trial

Federal Judge Patrick T. Stone has announced he will hear, in Madison, on March 28, the motions of 16 oil companies and 30 executives to vacate the jury verdict finding them guilty of violating the Sherman Anti-Trust Act.

At the end of the trial, the defense offered motions to set aside the verdict and for a new trial in the event the verdict is not set aside. The judge deferred passing sentence upon those convicted until he rules on the motion.

Crude Prices to Be Investigated

Another development that has grown out of the events at Madison is the plan of the Justice Department to investigate crude oil prices. Following complaints from some East Texas refiners, the anti-trust division of the department has embarked upon an investigation of crude oil prices in East Texas. The department proposes to find out whether major oil companies are responsible for maintaining the present crude oil prices through price-fixing agreements in violation of anti-trust laws. The job of making the investigation has been assigned to the Dallas office of the Federal Bureau of Investigation.

Some of the complaints from East Texas refiners attributed recent difficulties of the refiners to the convictions of major oil companies at Madison. It has been asserted that the companies have not been purchasing gasoline from the independent refiners and that the refiners are being forced, in some instances, to close down.

Oil Union Active

The Oil Workers' International Union, the affiliate of the C.I.O. for the oil industry, is renewing its organization efforts in the industry. Harvey C. Fremming, president of the oil union, made several speeches last week to oil company workers on the Texas Gulf Coast. He was doing follow-up work, after having been in the same area in April, 1937, for the inauguration of the union's national membership organization drive in the petroleum industry. Fremming proposed to go from Houston to Fort Worth, West Texas, and California, and to return to the East through the North and Middle-West. The oil union leader spoke pessimistically of conditions in the oil industry. He claimed that numerous refineries have been closed in Texas, mostly in East Texas, and in Oklahoma and Kansas.

Gas Industry Aids Housing Program

Coincident with the signing of the liberalized National Housing Act, the gas industry has announced a national program to stimulate construction and modernization of homes throughout the country. This program, to be inaugurated in March, has the endorsement and backing of the gas utilities and appliance and equipment manufacturers of the whole country.

More than 1500 gas companies serving a population of 80,500,000 people with manufactured and natural gas, through 17,022,000 meters, as well as hundreds of gas appliance and equipment manufacturers, will cooperate in this program. Thus, one of America's major industries, with capital investment of over $5,000,000,000, will assist in stimulating housing activities and increased spread of employment in the construction field.

The gas industry will cooperate and tie-in with all housing activities, private or governmental, together with the manufacturers of building equipment and supplies, and will stimulate nationwide interest in construction of new homes.

In this connection, the gas industry naturally will strive to bring about the equipment of new homes with automatic gas cooking and refrigeration equipment, automatic gas water heating, automatic gas house heating, air conditioning, incineration, and gas laundry appliances.

Market briefs

Outlook—Markets showing some improvement.

Crude Markets—Prices holding.

Refined Oil Markets — Gasoline prices tending to rise; fuel oil prices sagging.

CURRENT OPERATIONS

Week Ended	Daily Crude Production	Daily Crude Runs to Stills
February 12	3,324,500	3,150,000
Previous week	3,316,450	3,155,000
Year ago	3,286,050	3,020,000

CRUDE STOCKS

Date	Crude Oil (Barrels)
January 29	304,286,000
Week before	303,679,000
Year ago	285,384,000

REFINED OIL STOCKS

Date	Gasoline (Barrels)	Gas & Fuel Oil (Barrels)
February 12	87,813,000	119,293,000
Week ago	86,484,000	118,619,000
Year ago	73,585,000	100,735,000

DRILLING

Period	Wells Completed
Past week	360
Previous week	452
Year ago	397
Year Total:	
This year	3,573
Last year	3,512

Drilling

Plans are contemplated for a nationwide broadcast from the derrick floor of the Kern County, California, wildcat that is the deepest test ever drilled. Late last week the well was drilling at 13,312 feet, in hard shale, with no sand and no oil showings. The record-breaking test is Continental Oil Company's K.C.L. 2-A, in the Wasco area.

Off-Shore Development

The first sinkable drilling barge to be used in the Texas division of the Gulf Coast will be moved in shortly to Galveston Bay, where Standard Oil Company of Texas and Salt Dome Oil Corporation opened a new field February 12.

A wildcat in Matagorda County, north of Van Vleck, has given indications of opening a new producing district for the Texas Gulf Coast.

Several hundreds of productive acres have been added to the Lake Long and Lafitte fields, Lafourche and Jefferson Parishes, South Louisiana, through completions of extension wells.

South Texas

Success continues to reward prospecting efforts in South Texas. A production test was impending late last week on a test in San Patricio County, 2 miles east of White Point field and 8 miles southwest of Taft.

An oil-bearing sand was promising production in a test 5 miles south of Vanderbilt in Jackson County.

A showing in a Dimmitt County test has indicated the possibility of deep limestone production on the Chittim anticline, a major structural feature of Southwest Texas.

Proration Picture

Continuation of unusually strict allowables in March indicated . . . Further reduction advised in Oklahoma . . . Texas to continue shut-downs.

THE leading oil producing states contemplate continuing in March the exceptionally strict control of crude output that has prevailed so far this year.

Oklahoma's conservation officials had before them late last week a recommendation that the state's allowable be reduced further in March, after having been brought down to a comparatively low figure in February through an emergency order.

The Texas Railroad Commission held its regular monthly statewide proration hearing February 18, and it was indicated that there would be ordered a continuation of Sunday shut-downs of all Texas fields, although proposed Saturday shut-downs were ruled out.

To aid the states in determining allowables for next month, the Bureau of Mines speeded up its work of making estimates of needed production in March. And the bureau late last week made the forecast that market requirements for domestic crude production in March would be 3,391,600 barrels—46,600 barrels a day less than the February estimate, but about 7 percent more than the 3,159,000 barrels estimated by the bureau for March last year.

There will be a special hearing at Amarillo February 22 on prorating sour gas production in the Panhandle and other hearings. The allowable of the Plymouth field, South Texas, was increased about 3000 barrels.

March demand forecast above that last year

Daily average demand for crude petroleum in March will be 3,391,600 barrels, it was announced February 18 by the Bureau of Mines, a cut of 46,600 barrels from the February forecast of 3,438,200 barrels and the lowest daily average since last June's 3,366,000 barrels. The estimate is, however, about 7 percent larger than that of 3,159,000 barrels made by the bureau for March of last year.

The bureau made public its total figure in advance of release of its monthly forecast, and also published its estimates of daily production for the major states.

Under this forecast, required production in Texas next month will be 1,344,900 barrels a day, compared with an estimate for February of 1,376,700 barrels; Oklahoma 547,700 barrels, compared with 569,700 barrels; Louisiana 239,400 barrels, unchanged; Kansas 176,700 barrels, compared with 176,400 barrels; and New Mexico 105,100 barrels, unchanged.

Montana turns thumbs down on suggestion to prorate

The Montana Oil Conservation Board, meeting at Great Falls, late last Monday denied a petition of some operators in the Kevin-Sunburst and Cut Bank fields seeking proration, declaring curtailment of production would prevent or delay development of potential oil lands, discourage exploration of new structures, retard or prevent construction of new refineries and tend to "effect and perpetuate monopoly" by major companies.

The decision was the result of hearings that opened November 29, adjourned several times and were formally concluded January 21 after almost a month of session days. The vote was four to one, with chairman L. B. O'Neil, Howard Alber, R. C. Tarrant and W. E. Rice concurring, and O. M. Webb dissenting. The investigation was authorized by Governor Roy E. Ayers, to whom protests were made that only by restriction of output could a market be found for Northern Montana operators.

Rapid development of the Turner Valley field of Alberta, Canada, resulting in withdrawal of Canadian buyers late in 1937, was found by the board to be the principal reason for a crude surplus in the northern fields. A seasonal decline in gasoline consumption further aggravated the problem.

On the other hand, the board pointed to testimony indicating that two refineries are now under construction which will provide a market for much of the surplus crude, that the markets will be broadened by reduced freight rates which the opinion said are virtually assured and that a campaign has been launched to raise consumption of gasoline made from Montana crude at the expense of that shipped in. The board held that there was no evidence to show discriminatory practices by either transporters or owners of storage capacity in either field, nor was any evidence presented to show unlawful discrimination in purchases of crude.

The majority held that proration would tend to effect a major company monopoly of production, transportation, refining and marketing of crude petroleum in Montana and neighboring territory "to the disadvantage of, and possible destruction of, independent oil producers and refiners, as well as force Montana producers and refiners to compete, under the handicap of proration, with crude oil and its products produced in states and countries contiguous to Montana where there is not, and never has been, any control of production assumed by the state or government.

The decision pointed out that in the past year, 112,000,000 gallons of gasoline were consumed in the state, of which about 45 percent was imported from refineries in other states, and 1,844,000 barrels of crude were imported during the same period. "It appears that oil production in Montana, actual and estimated potential, is actually not sufficient to supply consumption requirements or supply requirements of all state refineries if operated to capacity," the majority ruled.

In his dissenting opinion, Webb maintained that evidence showed an inequitable system of production that was operating to the detriment of many operators unable to sell their oil while neighboring leases were being operated to capacity. He declared that proration corrected similar conditions in other states, and similar results could be achieved in Montana. He questioned the possibility of reduced freight rates on crude, declaring that railroads were making efforts to gain rate increases.

Webb declared the evidence disclosed that there was economic and physical waste in both fields and added that "The showing is sufficient to require the board to act in accordance with its duty under the law to prevent waste and conserve natural resources." Shutdown of stripper wells, which is now prevalent, is contrary to best oil field practice and could be avoided by proration.

Challenging the majority's claim that proration would aid monopoly, he declared: "In view of the fact the laws prohibit monopolies, I do not think this is a valid argument against proration. On the contrary, in my opinion, proration will be the salvation of the little independent who is without a market today and whom the board should not fear will ever effect or perpetuate a monopoly."

Further reduction in Oklahoma is advised

Further reduction in the crude oil allowable for Oklahoma was before the corporation commission at Oklahoma City late last week, with the recommendation by W. J. Armstrong, chief conservation officer, that the March allowable be set at 450,000 barrels daily. The figure is 97,700 barrels below the estimated market demand of 547,700 barrels made by the Bureau of Mines. Armstrong said he also recommended the hearing be postponed until February 25, in order to give producers and purchasers an opportunity to further consider the matter.

Numerous representatives of major companies said their firms were not buying any additional oil. Reference was again made to the recent 10 percent reduction in "takes" by Sinclair Prairie Oil Marketing Company, and a spokesman for Carter Oil Co. (Oklahoma Pipe Line) said that concern was storing nearly 10,000 barrels of oil daily.

Armstrong said that in view of this fact he thought all purchasers of the state, "big and little, would welcome a cut of 50,000 barrels." Armstrong also said that "For the month of March, conditions are really worse than I anticipated."

[*Continued on page 234*]

Labor Situation

Mexican decision expected soon . . . C.I.O. oil union president is on tour . . . Strike in Burma investigated . . . Continental renews bonus plan

A VERDICT in Mexico's oil dispute is expected to be reached in the near future, and oil companies operating in that country are looking forward with considerable anxiety toward the court's decision.

Another development of considerable importance in the labor situation is the current tour of the oil producing states by Harvey C. Fremming, president of the Oil Workers International Union, further promoting membership.

The oil workers' strike in Burma is being investigated by the Government of that country, while workmen partially return to work.

Continental Oil Company has benefited employes by re-adopting the 1937 bonus plan.

Mexican affairs are at critical point

Although it previously has been indicated that no settlement of Mexico's labor dispute would be reached soon, there are strong indications now that the matter may come to a head about the middle of this week.

This possibility looms because the verdict of the Federal Supreme Court on the appeals of the oil companies from the award of the Federal Conciliation and Arbitration Board, greatly favoring labor, is expected in the immediate future.

A section of the court has sidetracked all other business so that it can be free to concentrate on the oil case, an arduous activity, as documentation is voluminous and complicated.

What the verdict of the court will be is a matter of much speculation, although the rather general opinion is that it will uphold the board. Yet there are some who believe that the tribunal's ruling will not altogether favor labor.

An even greater speculation is what the companies will do when the verdict is rendered. Some opinion is that the firms will quit Mexico. However, there is a growing belief that the enterprises will decide to accept any decision, to protect their huge investments, and to make the most of some promising new fields in the central Gulf Coast belt.

Congressional sentiment is not very favorable to remarks Lic Antonio Villaobos, chief of the Federal Labor Department, made at Cerro Azul, to the effect that Mexican laws will be enforced, no matter whom they hurt. The solons' opinion is that such talk is more befitting a labor leader than a government official.

Further darkening the labor situation in Mexico is the threat of a strike in the Sinclair unit. This strike is scheduled for February 25, if the company does not make a temporary contract that is in accord with the Conciliation Board's award in the general oil conflict.

Union head does promotion work

Harvey C. Fremming, president of the C.I.O. International Oil Workers Union, and E. C. Conarty, secretary of that organization, were in Houston last week to check up on the work done by the C.I.O. since the oil union head inaugurated a national membership drive in Houston in April, 1937.

Fremming asserted that the oil industry is gripped by another depression, basing this statement on the fact that recently a large number of refineries in the East Texas district and Oklahoma have been shut down. At one of the meetings he declared that unless workers organized to demand their rights in this recession, business conditions will get worse from the standpoint of the laboring men. He further stated that there is more oil on top of the earth now than ever before and that every barrel may be subject to a price drop at any time.

Annual Meeting Planned

Fremming spoke last Tuesday night at a meeting of employes of the Humble Oil & Refining Company at Baytown, Texas, and also addressed closed meetings of C.I.O. oil workers unions in Houston. Before his departure from Houston he indicated that John L. Lewis, chairman of the Committee for Industrial Organization, may attend the annual convention of the International Oil Workers union when it opens in Houston on June 6. Fremming and Conarty left Houston last Thursday for Fort Worth and West Texas, and they planed to go subsequently to California and to return to the East through the North and Middle-West.

Burma oil strike

At a recent request of Burmah Oil Company, the government of Burma has agreed to set up under the Trade Disputes Act a court of inquiry to study facts of the company's terms and conditions of employment in the Burma oil fields and the causes of the present partial strikes of the company's labor there.

The company states that, except for essential services, no new labor will be added in the meantime, despite the fact that large numbers of unemployed in the area are anxious and have offered to fill the places of the strikers. Fifty percent of the labor is now working in the two principal fields. While the men are steadily, although slowly, returning in the Yenangyoung field, there has been no material improvement at Chauk.

Bonus plan readopted

The Continental Oil Company, Ponca City, Oklahoma, recently announced that its employes again will share with stockholders in the company's annual profits, under the 1938 bonus plan.

The company in 1937 distributed more than $777,000 among 5076 employes, equivalent to almost an extra month's salary for each employe. The 1938 bonus plan will be the same as that adopted in 1937.

Miscellaneous News

Federal investigation of East Texas crude prices begins . . . Yet government seeks higher commodity prices . . . Trade agreement with Britain planned

INVESTIGATION of crude oil prices has been initiated by the Department of Justice to determine whether the major companies may be conspiring to keep them so high as to force small refiners out of business.

Complaints from refiners in Texas and Oklahoma attribute their plight to the Madison verdict, which they claim has terrorized the majors into ceasing purchases from independents; department officials, anxious that nothing sully the record of that case, claim refiners began to go out of business long before the suit was tried and that the answer may lay in the crude price structure.

Investigation, of course, does not mean prosecution.

Five years of the New Deal have

not accomplished President Roosevelt's primary aim of restoring the price structure to the level of 1926, and he has again called for increased prices, only a few weeks after demanding that the industries of the country lower prices to within reach of the consuming public.

As the President calls for higher prices, the Works Progress Administration calls for increased funds to care for the unemployed and millions of people, working part time or not at all, find it difficult to meet even the low prices of which Mr. Roosevelt complains.

The situation is very confusing for some industries, as for example oil, with crude running about $1.35 in Texas and gasoling selling for 12 cents plus tax, in Washington, and 7¾ cents at Baltimore refineries.

Oil interests refuse to be stampeded by claims that petroleum resources will be exhausted by 1941, particularly in view of the latest estimates, which indicate more oil in sight than ever before.

The bogey of exhaustion has been raised repeatedly in the past 20 years, according to the Independent Petroleum Association of America, but oil continues to flow in ever-increasing quantities. Despite the advance of scientific exploration, the oil rule still seems to hold good that "oil is where you find it."

Prices are being studied by federal government

Higher commodity prices, so that those who owe may pay their debts in the same kind of dollar they borrowed —the original major objective of the New Deal—again is sought by the Administration, it was revealed by President Roosevelt February 15.

Government economists, the President disclosed, are now engaged in a study of the price situation, apparently in preparation for another attempt to secure stabilization at what is to be determined as the proper level.

With his demand for higher prices, the President again stands where he did when he entered office in 1933, when he said "The Administration has the definite objective of raising commodity prices to such extent that those who have borrowed money will, on the average, be able to repay that money in the same kind of dollar which they borrowed."

That the NRA, devaluation of the dollar, and other expedients resorted to by the Administration have not brought about that happy result is demonstrated by the fact that in April, 1937, he charged that commodity prices were greatly out of line and forecast their ultimate fall.

As recently as January 25 of this year, President Roosevelt apparently considered prices too high, for on that date he laid squarely upon industry the responsibility for maintaining existing wage levels while at the same time bringing prices down to within reach of the consumer.

So far, the President has not defined whether he is seeking higher prices for agricultural products, raw materials for industry, or finished goods. In some industries, it is said in other quarters, the prices of raw materials are too high in comparison with those of the finished products and in other industries the reverse is true.

In the case of oil—if that product is included among those which the President feels should bring a higher price —the Department of Justice now is investigating the possibility of market rigging on the part of the major companies to keep the price of crude so high as to be out of reach of the small independent refiners.

The President has not yet disclosed what action he contemplates to bring about the desired readjustment of price levels.

Federal investigation of crude prices studied

Federal investigation of the price of crude petroleum, for the purpose of ascertaining whether the major oil companies are responsible for its comparatively high level through price-fixing arrangements in violation of the anti-trust laws, is under way, it was learned at the Department of Justice last week.

The inquiry is understood to have been initiated in response to informal complaints lodged with the department that many small refineries in the Oklahoma and East Texas fields are being forced to cease operations. Similar complaints have reached members of Congress from the oil-producing states.

One of the reasons which has been assigned for the shutting down of small refineries is that the major companies have ceased buying their gasoline as a result of the decision at Madison, Wis., last month. Complaint to this effect has been filed with Senator Connally of Texas by the East Texas Marketing Association.

Color is given the charge by the fact that runs of East Coast refineries are continuing upward, indicating that the large refineries are attempting to produce all of their own gasoline needs and no longer buy from the small plants.

Justice Department officials, however, question whether this is the real reason for the shut down of small plants and believe the answer to the situation may be found in the price of crude oil itself. They pointed out that small refineries began closing down months before the Madison case was brought to trial.

The new factors which have been injected into the situation will not affect plans of the Government to proceed with its second case at Madison, it was indicated. It will also continue with its investigations in California.

Voiding of leases sought

Suits to cancel leases to three tracts of submerged land in Jefferson County were filed last week by Attorney General William McCraw. At that time, the attorney general announced that he would file suit on six other tracts which Governor James V. Allred has alleged were improperly leased.

This reverses a policy announced previously by McCraw in which he indicated that the Mallinson tract suit would be regarded as a test case and litigation on the other leases delayed until that suit was adjudicated. This change was based on the fact that conditions in the leases vary and that the prospect of an early trial would be increased if more cases were filed, McCraw said.

Trade pact planned with good customer

Consummation of a reciprocal trade agreement with the United Kingdom by late spring was forecast by Secretary of Commerce Daniel C. Roper February 16 in making public a detailed analysis of our trade with that nation as reports reached Washington that the delegation which is to negotiate for the United Kingdom had sailed for America.

Featuring the trade between the two countries last year was an increase of more than 350 percent over 1936 in imports into the United Kingdom of American crude petroleum, giving color to press reports from New York that the major powers quietly are building up reserve supplies of oil in the anticipation of war.

Exports of crude oil from the United States to the United Kingdom, Secretary Roper reported, increased from 160,000 barrels valued at $181,000 in 1936 to 753,000 barrels valued at $1,066,000 in 1937.

Marked increases in exports of refined products also were recorded, shipments of motor fuel advancing from 3,593,000 barrels valued at $7,889,000 to 4,648,000 barrels valued at $11,613,000; gas, oil and distillate fuel oil from 1,171,000 barrels valued at $1,561,000 to 2,068,000 barrels valued at $3,286,000; illuminating oil from 937,000 barrels valued at $1,663,000 to 1,294,000 barrels valued at $2,845,000; and lubricating oil from $11,932,000 to $15,485,000.

Only in natural gasoline was a decline noted, shipments to the United Kingdom dropping from 1,071,000 barrels valued at $2,350,000 in 1936 to 747,000 barrels valued at $1,948,000 last year.

Texas defends title to submerged lands

Protest against the United States' claim to title to submerged lands along the Texas Gulf Coast will be made by Attorney General William McCraw at a hearing at Washington, scheduled for February 23. The House Judiciary Committee will at that time take up Senate Joint Resolution No. 208, which would instruct the Attorney General of the United States to file suit on these tracts.

McCraw pointed out that Texas alone could claim title on such tracts, as an act of congress annexing the state to the Union recognized and guaranteed title in all public lands, this title to be paramount to any federal claims.

An opinion of the Attorney General of the United States has held that the federal government was powerless to condemn Texas land for military purposes and that "the eminent domain of the Mexican Republic in Texas passed to the Republic and State of Texas, and never vested in the United States."

Arkansas proration injunction postponed to March 28

Hearing of the injunction petition of William Monroe Layton and others against the Arkansas Board of Conservation, seeking to restrain the latter from interfering with production on Layton's leases in the Miller County, Arkansas, part of Rodessa, was continued in state court at Texarkana February 14 until March 28.

Spring A.P.I. District Meet Details Technical Advances

Colonel Thompson warns stricter proration . . . Engineers discuss wide range of technical operating matters . . . N. M. Hutchinson new chairman

By FRANK B. TAYLOR
Staff Writer

In contrast to recent alarming statements expressing apprehension that there is danger of a petroleum shortage in the United States, what the industry actually needs is markets for its already discovered volumes, which have grown so large there is urgent necessity for taking "another hitch in curtailment restrictions" if conditions are to remain stable. These, along with the expression that the distorted relationship of gasoline and crude prices indicates "somebody is cleaning up at the expense of others, and it cannot be continued long," were some of the interesting thoughts brought out, together with a number of interesting new developments in operating and engineering problems and practices, at the Spring Meeting of the Mid-Continent District of the American Petroleum Institute, Division of Production, held in Amarillo last week.

The warning of stricter production control need, particularly in winter months, came from Colonel E. O. Thompson, member of the Texas Railroad Commission and chairman of the Interstate Oil Compact Commission, who declared it might be necessary to place every well in Texas on marginal allowance and then grant additional output on a potential percentage basis and market demand. Despite recent reductions in allowed output, gasoline stocks continue increasing and already are at an all-time peak, he pointed out, and potential recovery is growing continually.

In discussing the distorted relationship of gasoline and crude oil prices, Thompson asserted a barrel of gasoline was cheaper today than a similar quantity of crude. This condition has caused 9 refineries in East Texas to close. Thompson declared the distortion in prices to be taking place at filling stations, where there is a margin of 5 to 7 cents per gallon, which caused him to cry "somebody is cleaning up at the expense of others, and it cannot be continued long."

He denounced in no uncertain terms the bill introduced by a Pennsylvania senator that would place a one-cent-per-gallon tax on fuel oil, declaring it an attempt to benefit the coal industry at the expense of the oil business, and urged all oil-producing states to fight the proposal. "The oil business should not be penalized because Pennsylvania has coal on hand," he continued.

In connection with this bill, he turned to the crude reserve situation because President Roosevelt had pinned a note on the measure that the oil reserve situation was more alarming than he had thought previously. The bill was proposed both as revenue and conservation measure by its Pennsylvania advocates. Thompson said there was no truth to the report that there will be an oil shortage by 1948, and cited the discovery of 95 new fields in Texas alone during 1937, and an increase of 500 million barrels in reserves during the year.

A goodly portion of Thompson's address was devoted to the benefits that have been derived from proration, particularly by independent operators. Prior to proration, he said, an independent who discovered a new field sold out immediately because of line drilling campaigns, and then looked for "greener pastures elsewhere." That condition has been changed. Today an independent has an outlet guaranteed for his oil, is assured of orderly development, and can procure cheap loans to finance operations. That this situation was not driving the industry towards monopoly is shown, he stated, by there being 1141 more operators in Texas than two years ago. He said every one of the 79,000 producing wells in the state is selling some part of its production, whereas 6 years ago there were 1300 wells without connections.

He denounced excessive drilling, however, as one proration factor being abused. A new oil well was completed every 40 minutes in Texas last year, which makes it continually harder to provide an outlet and an output sufficient to warrant operations, the Colonel brought out.

Determining Productivity

Practical methods of determining productivity in reservoirs on leases by bottom-hole pressure and core analysis, by W. S. Walls, Phillips Petroleum Company, presented the fact that in addition to the more apparent value of determining reservoir characteristics for the purpose of reserve and evaluation factors, that the same information was of great value in solving spacing problems and in efficient and economic operation. In specific regard to the latter problem of production, knowledge of actual reservoir conditions and of the changes that occur during production, are vital to suit the manner and rate of production to the particular formation. Such factors must be obtained by means other than pumping, it is shown, as in such instances the mechanical equipment would not correctly indicate the capacity of the formation to produce. Other common factors enter into ordinary gauge rating, a number of which have inherent errors.

Walls further detailed some of the requisites of making exact bottom-hole determinations, showing the possibilities presented by the use of static-bottom-hole determination, flowing rates or build-up, method and manner of applying core analysis to form a representative picture of productivity possibilities, and the application of each of these toward a comprehensive productivity-index. Much data of other authorities were referred to by Walls in his remarks, these being correlated to the particular problem of productivity determinates.

The many angles of the problem not customarily taken into consideration were properly shown in their relationship to the complete picture, and from this their importance was emphasized. The use of related formulae was explained, and explanatory graphs and research work on particular problems of productivity were explained.

Walls stated that the most recent findings, both in the field and in the laboratory, have substantially shown the desirability of productivity measurements, and that their further practical application and investigation seemed a normal expectancy.

Hydraulic Power Pumps

A discussion of the application of hydraulic power to subsurface pumps was given by J. F. Crawford, British-American Oil Producing Company, in a paper entitled "The Use of Hydraulic Pumps in Mid-Continent Fields."

Hydraulic pumping in the Mid-Continent is still in its infancy with the exception of the Oklahoma City field, where there are more than 50 installations. After describing the pumps and their installation, Crawford took up the problems encountered with them. Paraffin has been a decided problem in the Oklahoma City field. Two methods have been used to combat this problem, viz., chemical and mechanical. Considerable progress has been made along this line.

In an effort to determine the over-all efficiency of the present hydraulic pumps, Crawford took into consideration several wells with the following results:

"Using the total number of barrels produced and the total amount of energy required to operate all surface equipment, an average figure gave an over-all efficiency of 60 percent. These efficiencies are based on wells that have not been subject to paraffin accumulation in the tubing strings. Good operating wells have been found to have an over-all efficiency of as low as 42 percent due to paraffin accumulation without effecting the production." These calculations were made on wells pumping from 6450 feet. A study of down-time records showed a decided down-

ward trend because of decreases in mechanical failures and marked improvements in well conditions, he declared.

Tamping Shot Important

"My counsel to you above all things is: no matter what size the shot, no matter what the condition of the pay or how deep the well, you get the best possible results from your investment in oil well shooting if you properly confine it by proper tamping, as you thus compel it to do useful work where you want it done, rather than harmful work elsewhere," was the suggestion handed down by Paul F. Lewis, American Glycerin Company, in his paper, "The How and Why of Oil-Well Shooting."

He declared the only exception to this rule is: that when a well, new or old, is being squibbed from top to bottom of pay to free wall pores of mud or to scrub it free of other substances which coat the wall. In such cases, cleaning-out costs can be saved by tamping only with enough liquid for air seal so that the well can clean itself.

In answer to the frequent question: "What size shot should we use and how can this be determined?" Lewis presented a formula. He declared this formula could be used as a guide, although there "is no satisfactory formula for this problem nor do I believe it possible to devise one which could have very satisfactory general application, since each well is a separate problem."

In addition, he presented a number of basic safety rules governing the shooting of wells.

"Unitization of Leases and Pressure Maintenance," was the subject of a paper by E. O. Bennett, Continental Oil Company, which was excellently illustrated by slides and explained by graphs.

Bennett used two fields to illustrate the point of the paper; that the most valuable characteristic of crude oil in a reservoir is its energy, and that the conservation and proper utility of this energy is not only economically desirable but also of positive necessity if the greatest ultimate recovery is to be obtained. One of the fields used to illustrate the benefits of controlling reservoir energy was Tepetate, and numerous pictures were shown depicting the high-pressure equipment capable of working at 4600 pounds per square inch, with previous cold water test of 7200 pounds. The normal expectancy from one field 11 years old, calculated on the basis of areal extent and sand thickness, was 7,500,000 barrels. Through energy stabilization, about 13,900,000 barrels of crude have already been recovered from this field, and from present indications it appears that some 20,000,000 barrels will be the ultimate. In addition the natural gas used to hold the pressure on the sand is still within the structure and is available either for sale or for further re-pressuring in another field.

In essence, it was shown that the conservation of energy in a field was through returning the gas liberated from a barrel of fluid back into the gas cap within the normal structure. This volume would be approximately six to one. The result would be a uniform thinning of the saturation of the pay strata, until the gas/oil ratio proved the exhaustion of available crude. No actual encroachment would result from production. Bennett concluded by admitting the reluctance of the oil industry as a whole to recognize the great benefits of unitization and conservation of energy, but expressed the opinion that the time was at hand when accomplishments similar to those described would be the normal outcome of stabilized reservoir pressures.

A considerable portion of the program was devoted to cementing problems and developments. Besides two technical papers, a colored moving picture on the manufacture of cement was shown.

In summarizing the results of a great many tests carried out to investigate the action of sulphate solutions on set cement, and in applying this information to the problem of an oil well cement exposed to solutions of sulphates and chlorides at temperatures ranging from 100° to 212° F., it appears that the need for a sulphate-resisting cement may be more important when the corrosive waters are encountered at a lower temperature than it is in the deep wells where the temperature may be over 200 degrees, was the conclusion of Svend Rordam, director of research for Trinity Portland Cement Company.

He further brought out in his paper, "Sulphate Resisting Cement," that the use of normally non-sulphate-resisting cement, to which has been added set-retarding admixtures to make it suited for cementing at high temperatures, is, in the light of present knowledge, not to be considered as an advisable procedure. It is obvious, he continued, that it is important that the cementing of a well should stand up until the well is exhausted, which on an average is 10 to 40 years.

Continuing, Rordam stated, "A cement which is definitely not resistant to sulphate solutions at around 100 degrees may become more resistant at a higher temperature. On the other hand, a cement which is resistant to the attacks of sulphate waters at a low temperature is bound to be even more resistant at the higher temperatures. For this reason it would seem advisable that only truly sulphate-resisting cements be used in the cementing of oil wells."

The modern form of squeezing has developed in a very short time from a few experimental jobs to approximately 200 jobs per month at present, it was brought out by C. P. Parsons, vice president of Halliburton Oil Well Cementing Company, in his paper "Squeeze Cementing." Approximately one-third of these are in open hole and two-thirds are selective squeeze jobs through perforated casing.

Today, cement slurry is being squeezed indiscriminately against both the oil and water-bearing portions of a producing formation without shutting off any of the oil but shutting off the water, and in other instances for shutting off the gas but not the oil. In certain areas where new wells produce with an excessive gas/oil ratio, cement slurry is being squeezed against the producing formation before wells are completed for initial flow.

[*Continued on page 218*]

Name District Officers

N. M. Hutchinson, Cities Service Oil Company, Bartlesville, was elected chairman of the Mid-Continent District of the American Petroleum Institute, succeeding Van D. Bennett. The election took place during the spring meeting of the district at Amarillo last week.

Charles H. Keplinger, Shell Petroleum Corporation, McPherson, Kansas; A. J. Holland, The Texas Company, Pampa, Texas; and T. J. Hamilton, Phillips Petroleum Company, Oklahoma City, were elected vice chairmen. Henry Miller, Lario Oil & Gas Company, Wichita, Kansas, was elected secretary-treasurer.

The advisory committee for the ensuing year will be headed by Van D. Bennett, Sunray Oil Company, Tulsa. Other members of the committee are as follows: A. S. Ritchie, McPherson Drilling Company, Wichita, Kansas; L. G. E. Bignell, Oil & Gas Journal, Tulsa; J. J. Conry, The Carter Oil Company, Tulsa; K. A. Covell, The Pure Oil Company, Tulsa; C. A. Daniels, Phillips Petroleum Company, Amarillo; C. P. Dimit, Phillips Petroleum Company, Bartlesville; J. G. Dyer, Continental Oil Company, Ponca City; J. K. Ellis, Transwestern Oil Company, Oklahoma City; A. N. Pardee, The Texas Company, Tulsa; W. W. Fleming, The Ohio Oil Company, Tulsa; C. A. Holloway, Lee C. Moore & Company, Wichita; R. K. Huey, Deep Rock Oil Corporation, Tulsa; T. C. Johnson, Wichita; R. S. Knappen, Gulf Oil Corporation, Tulsa; H. W. Ladd, Stanolind Oil & Gas Company, Tulsa; Lewis List, El Dorado Refining Company, El Dorado, Kansas; Glenver McConnell, Shell Petroleum Corporation, Tulsa; Max Mahaffey, Cities Service Oil Company, El Dorado, Kansas; A. H. Proctor, Magnolia Petroleum Company, Ada, Oklahoma; W. G. Ricketts, Amerada Petroleum Corporation, Tulsa; C. O. Rison, Indian Territory Illuminating Oil Company, Oklahoma City; L. E. Smith, National Petroleum News, Tulsa; H. M. Stalcup, Skelly Oil Company, Tulsa; J. H. Stewart, The Atlantic Refining Company, Tulsa; E. N. Wilson, Magnolia Petroleum Company, Ada; F. W. Floyd, The Carter Oil Company, Tulsa; Oscar Hatcher, independent geologist, Ada, Oklahoma; M. A. Sherwood, Shell Petroleum Corporation, McPherson; J. S. Montgomery, Phillips Petroleum Company, Wichita; J. F. O'Shoughnessy, Lario Oil & Gas Company, Wichita; C. S. Warren, Cities Service Oil Company, Bartlesville, and N. M. Hutchinson, who serves as an ex-officio member by virtue of being district chairman.

American Institute of Mining and Metallurgical

Petroleum Section general session hears papers on economics and technology . . . World consumption of petroleum . . . Government and progress . . . Capital and labor.

By WM. V. GROSS

PRESENTATION of a widely diversified program at the 148th annual meeting of the American Institute of Mining and Metallurgical Engineers, which was held in New York February 14-18, attracted a large number of men from the petroleum industry.

Aerial geology, geophysics, engineering, economics and production development symposiums were sessions that drew attention from oil men.

General Session

Under the chairmanship of M. Albertson, Shell Petroleum Corporation, Houston, the general session of the petroleum section of the Institute, proved one of the most interesting of the convention.

The session, held Tuesday morning, was partly economic and partly technical, having two technical papers and two of general interest dealing with consumption of petroleum.

That the technical paper which can be applied to operating conditions by the practical field engineer is the type which receives greater attention in such a session was demonstrated by the reaction to a paper prepared by G. E. Cannon and R. C. Craze, research engineers with Humble Oil & Refining Company, Houston. Title of the paper was "Abnormal Pressures and Pressure Variations with Depth of Petroleum Reservoirs." The paper discussed results of a study of reservoir pressures in the Gulf Coast area of Texas and Louisiana, showing the general relation of reservoir pressure to its sub-sea depth, as well as cases where abnormal reservoir pressures have been encountered. Data presented showed why it is necessary to use muds having a relatively high density in many of the deeper wells of the area.

Conclusions of Cannon and Craze embraced the following important observations.

1. Pressures in most fields of the Gulf Coast are substantially equal to 0.465 pounds per square inch per foot of depth.

2. Below minus 7000 feet, pressures in excess of this value are frequently encountered.

3. The highest pressure/depth ratio so far encountered was 64 percent higher than the normal value and required a mud density of 15 pounds per gallon for its control.

4. The occurrence of abnormal pressures cannot be correlated with geographical location or geological formation.

5. The variation in pressure with depth in any well encountering abnormal pressures is usually erratic.

6. One explanation for the abnormal pressures is that below some depth the earth strata cannot support the weight of the overburden and are undergoing compaction.

In presenting the data upon which the foregoing conclusions were based, Cannon and Craze pointed out that it should not be inferred that a mud with sufficient density to control a pressure of 0.465 pounds per square inch per foot of depth (9 pounds per gallon) can be used safely for drilling in the normal Gulf Coast field, because of the substantially high pressure gradients encountered to the top of the gas or oil sand. They said that usually a mud density of at least 9.8 pounds per gallon (51.5 pounds per square inch per 100 feet of depth) is necessary for ordinary drilling in new areas. This allows a reasonable factor of safety.

Data was presented on wells at Medio Creek, Roanoke, Dickinson, Bel, Lirette, Cheek, South Crowley, Darrow, and Chalkley to show normal and abnormal pressures. With one exception, all the wells observed were drilled to points deeper than 7000 feet below sea level. Cannon and Craze observed pressures as much as 64 percent above normal.

The authors presented a curve showing minimum mud weight necessary to control maximum abnormal pressures encountered in Gulf Coast fields, the heaviest shown being approximately 15.4-pound mud for a depth of about 10,800 feet.

"Rational Development of the Tempino Oil Field," written by the production department of De Bataffsche Petroleum Maatschappij, The Hague, was another technical paper presented at this session. It is abstracted in the foreign section of this issue.

"World Consumption of Petroleum and Its Products," by V. R. Garfias and R. V. Whetsel, Cities Service Company, New York, another paper presented at this session.

"World Consumption of Petroleum Products and Related Fuels for Military Purposes," a paper by V. R. Garfias, R. V. Whetsel, and J. W. Ristori, Cities Service Company, stated that during the last eight years the authors had been trying to estimate world consumption and related products, but had been unable to account for all the supplies available in any one year. There has remained at all times a balance which at first was thought to represent almost entirely additions to stocks in foreign countries. But since this discrepancy continued year after year—over 148,000,000 barrels in 1937—it became unreasonable to conclude that corresponding additional foreign storage capacity was continually being made available. It became clear that the balance in question was due to causes other than to addition to stocks, the paper added.

There is no reliable data available either on storage capacity and therefore oil stocks, or on petroleum consumption for military purposes in foreign countries, the paper concluded, since this information is so closely related to national defense that its divulgation is prohibited.

The air fleets of Spain no doubt consumed in 1937 more gasoline than the same number of military planes in France, while the Japanese navy, as the result of hostilities in China, obviously needed during the year more fuel oil than a corresponding American or European fleet, it was shown.

A table presented showed that in 1937 close to 60,000,000 barrels of petroleum products were consumed for military purposes, which was about 8,000,000 barrels above the total for 1936.

Speaking on interrelations of technology, economics and government in a balanced and progressing economy, Dr. Harold G. Moulton, president of the Brookings Institution told the joint meeting of all divisions of the American Institute of Mining and Metallurgical Engineers that any curtailment by legislation of technological advances would prevent any further rise in the American standard of living. He said also that only by improving technical process and lowering costs of production can progressively higher standards of living be obtained. "Increasing the purchasing power of the entire population through the lowering of prices is the best way to benefit the great masses of the American people," he said. "Constantly increasing efficiency and production on the part of both labor and capital is the road to progress," Dr. Moulton declared.

He was followed on the Monday afternoon program by Dr. Leo Wolman, professor of economics, Columbia University, who spoke on "Labor and Capital," declaring that while the volume of labor legislation enacted in the last several years had brought us abreast of the most advanced countries of the world, the economic policies that legislation reflects may be considered to have done more harm than good, especially when viewed in relation to our large volume of unemployment and the serious uncertainties of the business situation.

Unwise terms of our law of trade unions and the uncontrolled zeal of its administrators may be revised in the light of experience and the protests of the laws own beneficiaries, Dr. Wolman inferred. At the point where labor

Engineers Presents Widely Diversified Program

Special sessions have discussions on aerial photography in exploration . . . Geophysicists review progress of that science in recent months . . . Educational plans and advances.

Foreign Editor

policy touches economic conditions, the two powerful factions of the American labor movement appear to look with a less friendly eye on the bewildering succession of economic experiments and to have a deep nostalgia for simpler and more prosperous economy, he stated. "From the NRA to the proposed wages and hours bill, national policy has been directed toward increasing national income by raising rates of wages and toward increasing the volume of employment by reducing the hours of work. Underlying these plain and simple ends has been a deep-seated and widely accepted belief in the policy of shifting income from the consumers of capital to the consumers of goods, from savers to spenders, from the rich to the poor, and thus stabilizing economic activity and perpetuating prosperity," Dr. Wolman declared. It was brought out by the speaker that conditions of labor we have latterly put into effect in this country seem to depart from accepted standards of moderation and reasonableness. They are gauged to the conditions of business at the peak of booms and as such may successfully prevent improvement in business when industry is on the rise. They may fall to arrest the fall when industry is in a decline.

"These labor policies are not new or peculiar to this country," Wolman stated. "They are integral elements of the larger policy of price control, restriction of output, pump, priming, and the raising of consumers purchasing power. As such, they have run a long course in many parts of the world and they have not come through with flying colors."

Another interesting thought brought out by the professor of economics was that in place of a labor shortage, which was the case in previous recoveries, there appears to be a chronic labor surplus. Despite this surplus, wages have risen sharply instead of falling, though these advances in wages were not required to overtake disproportionate increase in the cost of living.

Petroleum Economics

The oil industry of America is surely, and not so slowly, heading toward government control, was the note of warning sounded in papers and discussions at the Economics Section of the Petroleum division February 17.

Under the chairmanship of Sydney A. Swensrud, assistant to the president of Standard Oil Company of Ohio, and of Dr. Joseph E. Pogue, vice president of Chase National Bank, New York, the economics program embraced four papers:

"What Are the Uneconomic Uses of Petroleum," by John Gill and E. T. Knight, Atlantic Refining Company; "An Equilibrum Theory of Proration," by Dr. Pogue; "The Market for Oil Securities from 1932 to 1937," by Norman D. Fitzgerald, Department of Petroleum Economics, Chase National Bank, New York; and "Administrative Problems in Co-Operative Stabilization of Economic Domains," by Dr. Alexander Sachs, economist, Lehman Corporation.

In discussing the current attitude of incumbent government with reference to the oil business and to the public at large, Dr. Sachs said in effect, "Vicious purpose often is masked behind great zeal for the public welfare," explaining that the sentiment was not new, that Alexander Hamilton, the great federalist, had voiced in the first issue of "The Federalist" in the early days of the nation

The address of this economist (he did not have a paper) was most attentively received, because the audience seemed to feel that he really had something on the ball—something definite to offer—not as a battle-scarred warrior of oil industry trials, but as a newcomer, presenting a fresh view distinctly from the outside, one who had not been in the game long enough to lose the value of unprejudiced observation of its vicissitudes.

Sachs did make a specific prescription for the ills of proration, saying that the industry should organize a board which would function for all branches of the industry in a manner similar to that in which the Federal Reserve banking system functions for finance. His idea was to form a nonpolitical body which would not change with the change in government administrations. Have the group be comprised of experts, picked by recognized petroleum associations, on specific divisions of the industry—such as finance, production, drilling, refining, pipe lines, and marketing, constitute such a board, was his suggestion. This general board, located in a central spot, would be advised by similar subordinate boards selected in each state. It would then make specific recommendations for the amount of drilling, production, refinery runs, etc., in each state to each state.

When Sachs was asked if he knew of a single instance where such a scheme had worked out in this country, or if it would be possible to have such an organization under the laws, he replied that such a scheme had definitely worked out in European countries in various industries, but that in America, the only industry that had tried it long enough for it to have stood the test of time was the banking industry. He was again referring to the system of federal banks.

Going further into the subject, Sachs recommended that the above sketched proration body should include also a representative of the Interstate Compact, adding that "we should implement the proration authorities and the Interstate compact."

Earl Oliver, appraisal engineer of Ponca City, wanted to know in the discussion if we should not rather try to locate the causes of proration ailments and then eliminate them as a means of staving off political control of the oil industry.

Sachs' reply contained in part the thought that "it is the inflexibilities in the administration of proration, where it is not controlled by an integral organization, that give rise to sources of political pressure which make proration's administration difficult."

In discussing the legal aspects of putting Sachs' recommendations into effect, it was brought out by the economist that the production quotas the industry receives today from Washington are emanations from a system which is a survival of the code, which has been declared illegal.

On being questioned about the dilemmas of the oil industry, Sachs inferred it looked too much to the immediate future or to the now and did not consider sufficiently the long-time advantages or disadvantages of this or that policy. "People talk about planning," he said, "when what they really mean is some sort of a scheme for taking care of immediacy—and that's the oil industry."

Equilibrium by Proration

"An Equilibrium Theory of Proration," a paper presented by Joseph E. Pogue, vice president, the Chase National Bank, and a well-known petroleum economist, carried the thought that any mechanism, either natural or artificial, for regulating the functioning of a given unit in the general economy, must operate toward the maintenance of equilibrium if it is to survive. The petroleum industry is surrounded not

only by the economic factors common to other industries, but by an entire extra set of unique elements centering about the fugitive character of crude petroleum under conditions of competitive development, it was stated.

Proration developed in response to a serious dislocation between supply and demand. Up to the middle of the last decade, competitive forces operating without restrain were able to maintain an approximate balance between crude oil demand and the aggregate open-flow production of our oil wells. With the perfection of an extraordinary range of new technology and the maturing of the rate of growth in the demand factor, the aggregate open-flow capacity of our oil wells expanded beyond the requirements of the market in a manner and to a degree that appeared to be a permanent new relationship, Pogue concluded.

At this juncture a new kind of economic factor becomes essential to reestablish equilibrium under the new circumstances, and the instrumentality obviously had to be of a kind that would permit the current supply of crude petroleum to be less than the open-flow of oil wells. The Rule of Capture became untenable at this point and was replaced by a modifying influence—proration, it was shown.

After proration reached a condition of wide application, it became apparent that the ultimate recovery of oil and the flowing life of fields were increased by virtue of operating wells at reduced capacity.

Proration has been constructed from the restricted flow per well and "market demands," with the various fields and producing states forming the basis for the different allocations, it was stated. Efficient, low-cost production of crude oil obviously requires a larger underground reserve than would be needed to balance demand under rapid, open-flow conditions, Pogue added.

Economic Uses

John D. Gill and E. T. Knight of The Atlantic Refining Company contributed substantially to the interest aroused in the section of the petroleum division devoted to economics with their paper "What Are the Uneconomic Uses of Petroleum?"

This paper, presented by Gill, came to the conclusion that there are uneconomic uses of petroleum, saying: "A product and the process of its production are to be viewed as economic when they elevate the total material welfare by a greater measure than would be effected by the expenditure of the same amount of energy in another direction. Advancement of the economic welfare requires freedom for the exercise of initiative by multitudes of men.

"Conservation is not tantamount to a hoarding of resources but, rather, true conservation furthers material welfare by permitting the usage of resources in accordance with the best information of the time," said the authors in taking issue with those who hold that there was waste in the old days because the oil industry did not then obtain from a barrel of crude what it obtains now.

"It is better to use what we have now," said Gill and Knight, "than to save it for we know not what."

Speaking of those who cry out that our petroleum reserves are fast dwindling and call for more stringent production regulatory measures, the authors said, "probably the majority have been pseudo-conservationists with the all too obvious ulterior motive of restricting the use of petroleum to further the prosperity of other industries. The latest advocate of severe restriction proposes to achieve that end by levying a heavy, discriminatory sales tax on fuel oil. It has been suggested that one purpose of the tax is expansion of markets for coal by lessening competition from fuel oil.

"There was a time not so long ago when the price of gasoline would have been raised by three cents a gallon for every cent of tax on fuel oil. Fuel oil is produced when gasoline is produced. It must be sold in competition with other fuels and priced to clear the market of it. Any 'conservation' of crude effected by a tax on fuel oil would result primarily from restricted use of gasoline. Gasoline users would have to pay the tax without any benefits therefrom.

"When uneconomic, punitive taxation is levied, there is started a train of damaging sequences to which no visible end can be seen."

Wolf, Wolf for Thirty Years

The authors expressed alarm over the "apparent complacency" with which the oil industry views the approach to socialization or nationalization of resource, especially the indifference of the industry to the unsound preachments of the tax advocate, who, assuming the role of patriot-conservationist, defends his restriction plan on the ground that petroleum must be saved in the interest of national defense.

"The oil industry has now the largest proven reserve of its 80 years of experience. It has been listening to similar cries of 'wolf, wolf' for thirty years."

It might be interesting, they inferred, that an examination be made of the facts to determine what difference it really makes whether the supply of oil will last for 10 years, or, by rigorous restrictions on the use of known reserves, 15 or perhaps 20 years.

But, they brought out as almost axiomatic that our country cannot afford to retard its peace-time economic development by restricting the use of products which have proved themselves essential to that development.

"Depletion of the petroleum reserve is not in sight. Conservationists might take courage in this fact and find its substantiation in the willingness of practical oil men to maintain and expend investments totaling billions of dollars for the transporation, refining and marketing of petroleum products."

Referring to those who condemned certain companies for exporting American-produced crude on the grounds that it might be needed at home some day, the authors stated: "These overseas transactions do not represent a trading of our heritage for a mess of foreign pottage. Economically, the export of oil can be justified on the ground that it enabled us to purchase from abroad vast quantities of products not obtainable in our own country and which were absolutely essential to our comfort and development. In a general way, they represented most intelligently directed economic efforts, most likely to advance our standard of living."

Dr. Pogue, commenting on the paper of Gill and Knight, said that the paper should have been titled the "Inconvenient," rather than the "Uneconomic Uses of Petroleum," explaining his remarks by saying that we do not have fair and unfair competition; we have convenient and inconvenient competition; that is—inconvenient to others.

Having knowledge of some phases of Dr. Pogue's equilibrium theory of proration, Gill countered by referring to legislative trends, stating that "we have to guard against a piling up of those types of regulations which tend to freeze things."

Oil Stock Behavior

Norman D. Fitzgerald, Department of Petroleum Economics, Chase National Bank, New York, gave a paper at the session titled "The Market Behavior of Oil Shares from 1932 to 1937," a period including the depths of the depression, the broad and spasmodic recovery, and the recent recession collapse.

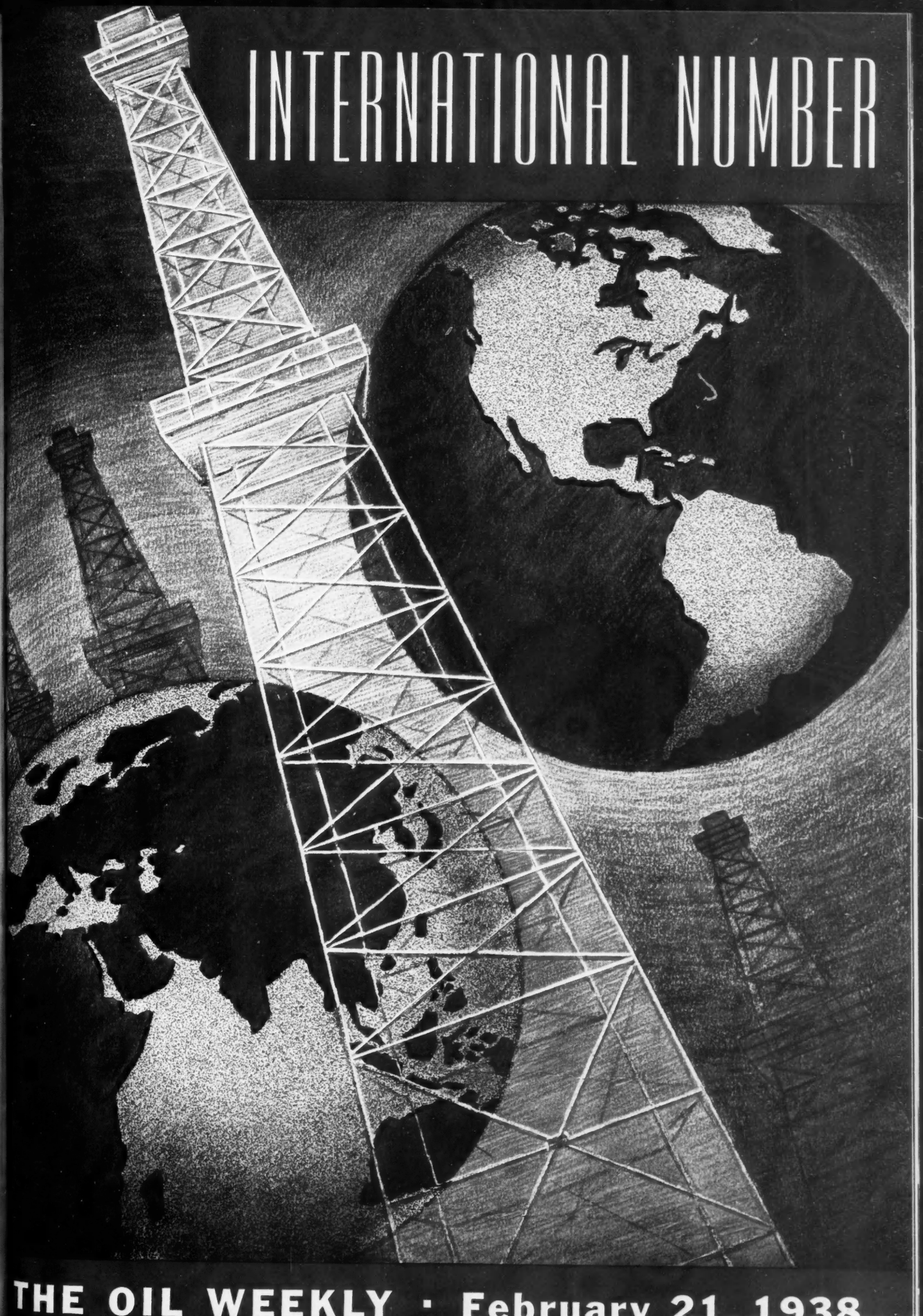
In the first part of Fitzgerald's paper his observations were based on an analysis of 13 stocks; in the latter part on 6 oil company stocks. Some of his observations included the following thoughts: Correlation between crude production and fluctuation of oil stock prices is by no means good. Joint consideration of price and production of crude oil in analyzing the market appraisal of oil securities should yield better results than separate consideration. It is reasonable for prices of oil stocks to go up or down with general economic conditions. Price of scrap steel fluctuates with business conditions and with prices of the oil stocks. Prices of oil securities are influenced by such internal factors as the value of crude oil production and the value of refinery output.

When Fitzgerald's analysis was extended to certain major economic factors external to the oil industry, it was found that during the period considered (1932-37) the index of the 13 oil stocks considered was more closely related to these external factors than to oil industry factors. This is not as true of the individual issues, he brought out, for many oil securities have moved away from the average of the group.

Comparison of differential movements was limited to six oil stocks for which quarterly earnings are available. Among the economist's statements were these: Earnings are an important influence on stock prices, while deficits are not as significant. Earnings roughly measure the capital employed, but there is, however, only the vaguest relationship between deficits and the size of the business. Stock prices are free to fluctuate with earnings, but not with deficits.

In conclusion, Fitzgerald said: "Economic factors external to the oil industry appear to have been of major importance to the movement of oil stock prices as a group in the past six years. This behavior is characteristic of the securities of an industry which serves a diversity of industrial and consumer requirements and is maintaining its competitive position.

[*Continued on page 216*]


INTERNATIONAL NUMBER
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World Oil Symposium

American Institute of Mining and Metallurgical Engineers hears speakers who present interesting data on foreign activity and conditions

By WM. V. GROSS
Foreign Editor

New York.—Basil B. Zavoico, Houston, Chase National Bank, chairman of the American Institute of Mining and Metallurgical Engineers' symposium on foreign production, opened that session the afternoon of February 15 with a highly interesting discussion on the oil industry of United Socialistic Soviet Russia, most of which was "off the record."

Zavoico's figures put Russia's production for 1937 at 211,000,000 barrels, an increase of 4.71 percent over the 1936 output but only 84.25 percent of the planned output of the Soviets. Drilling in 1937 amounted to 65 million feet, a decrease from 1936 accomplishments and only about 78 percent of what had been planned, he said.

Runs to stills in Russia amounted to 194,000,000 barrels, which was 88.5 percent of the government's planned runs and about 2 percent above those of 1936.

Exports, however, which amounted to 19,000,000 barrels in 1936, were down to 16,000,000 barrels in 1937, due, no doubt, to increased domestic consumption.

Zavoico brought out that the Soviets had not failed in their efforts to discover new reserves, but the discussion following his paper brought out that some of these new fields were being allowed to remain undeveloped, a condition attributable, some said, to the peculiar set-up of industry in the republics.

Wells have been brought in in a new field right in the middle of the Volga river during the year that have initial productions ranging from 1000 to 1500 barrels per day. New fields were found in the Permian Basin of Russia during 1937. Russia's Emba district recorded broad spread discoveries during 1937, though little practical economic advantage has been taken of them yet.

Zavoico's paper on Russia was followed by that of C. C. McDermond on Venezuela, which was presented in abstracted form by W. V. Gross of THE OIL WEEKLY.

Poland

Two new fields discovered during year not expected to halt down trend

WHILE Poland's drilling activities in 1937 were confined largely to extensions of old fields in the Jaslo district, reserves of proven lands were increased by some discoveries during the year, according to a paper prepared by Charles Bohdanowicz, professor of economic geology, Warsaw.

Poland's new fields are Targowiska and Czarna, both of which, however, are small and not expected to stem the downward trend of the nation's production curve which has continued uninterrupted since 1925. Targowiska is grouped with the old Krosno-Krosciensko area of Krosno County, while Czarna is a Lesko County contribution.

In dropping to 50,066 cars in 1937, Poland production registered a 2 percent decline from the 51,068 cars produced in 1936. (One car equals 74 barrels). Production in Poland for the previous six years had been, in terms of carloads of crude: 1930—66,277 cars; 1931—63,028 cars; 1932—55,668 cars; 1933—55,067 cars; 1934—52,788 cars, and 1935—51,476 cars.

Contrasting sharply with the trend in production, total meters drilled in Poland have shown a steady increase since 1932, gradually rising from 58,478 meters in that year up to a total of 138,835 meters in 1937. Meters drilled in 1936 totaled 107,001, indicating the effort now being made to stem the downward trend in production. The footages for the last two years represent completion of 328 wells in 1936 and 332 in 1937. In this latter year the total can be broken down into 279 producers, of which 211 were new wells and 68 were old wells deepened, and 53 failures, of which 34 were new attempts at production and 19 were deepening jobs. In 1936, 272 producers and 56 failures were recorded; 210 of the producers were new wells, while 62 of them were deepening jobs. Of the failures for that year, 40 were new jobs and 16 deepening operations.

The average initial daily production from the deepening jobs in 1937 was 1600 kilograms, while that obtained from the new wells was only 1200 kilograms. The reverse situation held in 1936, when the average new well yielded 1800 kilograms as against 1700 for the deepened ones. These figures also show that despite the considerable increase in footage drilled and the relatively small (only 4 wells) increase in the total completions for 1937 over those of 1936, that the average well completed in 1936 was much better than the average one completed in 1937.

Two new gas fields were found during the year: Opary, 25 kilometers northwest of Daszawa, a famous old gas field, and Belicze, 25 kilometers southeast of Daszawa. Wildcatting on the whole was ineffectual in Poland from a commercial standpoint. In this connection Bohdanowicz remarks:

Future Drilling Program

"In order to keep production at the volume of 1936-37, and even to increase it by 10 percent in 1940, it would be necessary, according to the Association of Polish Petroleum Engineers at Bory-

slaw, to intensify drilling of exploitation wells so as to bring up the meterage drilled to 150,000 meters in 1938 and to 225,000 meters in 1939."

The author estimated that 380 new wells would be needed in 1939. There were 245 in 1937. He says, too, that meeting the 10 percent increase in production in 1940 would call for drilling 480,000 meters, or approximately 900 wells, in that year. On the premise that a 1200-meter exploitation well would cost 360,000 zlotys and a wildcat 2000 meters 1,800,000 zlotys, the paper projects in connection with the drilling program an expenditure of 44,000,000 zlotys in 1938, of 70,000,000 zlotys in 1939, and or 120,000,000 zlotys in 1940.

Major operators, comprising Malopolska, Galicia, Limanowa, and Standard-Nobel interests, working principally in the fields of Boryslaw, Bitkow, and Rypne, control 59.4 percent of the total oil production of Poland, in spite of a relatively smaller drilling effort on their part. Others, operating principally in the fields of Jaslo district and those of Drohobycz outside of Boryslaw, accounted for 53.3 percent of the meterage drilled, interesting to compare with their recovery.

"In carrying out the broad prospecting program upon the plains of northern and western Poland, the Polish geological survey covered 40,000 square kilometers by regional magnetometric surveys in 1937 and 350 square kilometers by detailed surveys."

Surveys made with gravimetric apparatus have covered 6000 square kilometers in the eastern sector of the Polish lowlands and 5000 square kilometers in the western sector, in addition to 2600 kilometers of detailed surveys, and "upon the Volhynian (Wolyn) area and in the Holy Cross Mountains (Gory Swietokrzyskie) were ascertained by pendule 50 new gravity anomalies."

Jaslo field was the most active in drilling in 1937, as it has been for some years, accounting for about 50 percent of the nation's total footage. It accounted also for 182 completions out of the total for all fields of 332. But the Boryslaw fields hold the record for production, the 26,000-car output for 1937 amounting to 52 percent of the country's total.

Pipe Line Projects

Pipe line construction developments in Poland during the year were headed by construction of a combination 10- and 12-inch line from Roztoki to Sandomierz-Ostroweic-Starachowice, a 280-kilometer project. Bohdanowicz stated that in 1938 this line will be extended to Radom, and from the trunk line thus laid out branches will be built to Rzeszow and Rozawadow. The line is designed to operate at a pressure of 35 atmospheres, (14.7 pounds to an atmosphere) and it is planned that it will eventually carry 500,000,000 cubic meters of gas annually.

Plans for the above contemplated line are based on the hypothesis, the author says, that Roztoki field will accommodate 300 wells, each having a "summary" production of 20,000,000 cubic meters of gas. In other words, the plan is based upon an elementary hypothesis of a six billion cubic meter gas reserve. Bohdanowicz states nothing is known to justify such an hypothesis.

Netherlands East Indies

North Tampino field has eight zones in area explored to date

DE BATAAFSCHE Petroleum Maatschappij's production department at The Hague prepared for presentation at the Tuesday morning general session one of the most interesting of the foreign papers: "Rational Development of the Tempino Oil Field," one discovered back in 1929 some 175 miles north of Palembang, Sumatra, Netherlands East Indies.

Tempino was one of those rare strikes where the nature of the holdings, belonging solely to Nederlandsch-Indische Aardolie Maatschappij, made it possible for the operating company, De Bataafsche Petroleum Maatschappij, to develop the field as a unit.

Subsequent developments have established production on the two northern of the four possible highs of the anticline, which trends in a northwest-southeast direction. The field is divided into three main parts by two transverse faults.

The field, called North Tempino, because the southern highs have not been exploited, has eight sand layers separated by shale bodies. The shale bodies are considered to be continuous, blocking vertical movement of the oil.

North Tempino's first well was completed March 31 for 700 barrels of oil and 400,000 cubic feet of gas. The next location was drilled 600 feet west and, according to correlation, about 15 feet deeper, tectonically. It initialled 1500 barrels of oil and 1,200,000 feet of gas from sands Nos. 1 to 6, inclusive, the paper said. After comparing these two, the next, or third location was spotted a mile north of the second well and turned out to be the best of the trio, yielding 1700 barrels and 970,000 feet of gas.

Drilling on this part of Tempino was interrupted until March, 1935, but the three producers were kept on production during the period 1932-1935. At the end of this period it appeared that the productive complex could be divided into eight layers. The wells showed annual declines of only six percent during the three years, and the oil/gas ratio remained practically constant, notwithstanding the high rates of production. The beans, too, were practically unchanged during the period.

Location of the wells relatively high up structure lent strength to the theory of a water drive. But the scarcity of the wells made it difficult to establish this condition. For, as the authors brought out, as long as cumulative withdrawals from an area are small compared with the total recoverable reserves, wells show a very small decline anyhow. So the wells were considered as still being of an exploratory nature and future locations were stepped out in such a way as to gain maximum structural information. Therefore, wells were drilled as high up structure as commensurate with being a safe distance from the gas cap. Exploratory wells were spread out as far as possible over the whole structure, rather than being stepped out on one flank.

Those penetrating saturated sands had gas/oil ratios of about 500 cubic feet per barrel. As long as they did not show any appreciable increase in this ratio, the rate of production was considered rational and the wells allowed to produce without altering the beans. Increased ratios, however, were taken to indicate gas was being set free far away from the well and eliminated as a help in getting the oil to the surface, and such wells were beaned down. "Also, if the wells were allowed to continue producing at a high gas/oil ratio, an area of low pressure would be created and the gas cap, as well as the water, might break through at an early date."

Drilling revealed only one well with a gas/oil ratio of 1500/1, and that well, located near the axis, was shut in in three weeks, a practice of great importance in rational development, the authors stated.

Multiple zone exploitation in North Tempino applied in part the following principles: (Total thickness of the 8 horizons was about 550 feet.)

No zones should be combined if at a later date in the productive life of the well water might be expected to reach the well through encroachment in one of the intermediate levels, and sands with appreciable differences in character should not be produced simultaneously.

Gas/oil ratios in sands Nos. 1 and 2, containing more acreage than the underlying sands, increased with the wells on a given block, indicating the water drive in these sands was not strong enough to keep pace with withdrawals. Under these conditions, two rows of wells, spaced 800 feet apart, were drilled. In some cases, Zones 3 and 4, water bearing in parts of the field, were shut off by multiple stage cementing when 1 and 2 were combined with deeper producing horizons.

North Tempino has 38 wells. Except two wells abandoned before reaching production, only one well was located in such a manner that it had to be closed in on account of high gas/oil ratio. All wells are still flowing and it is not anticipated that artificial lifting will be used for a long time. The paper concludes with the statement that the wells have been located on the assumption that the encroaching edgewater will be the main driving force. "In case at a later date it should appear that depletion plays an important part in

the recovery of oil, the present wells will anyhow fit into the location scheme required under the latter conditions." Earlier in the paper the authors had described "depletion reservoirs" as those in which "the energy required for the movement of the oil is supplied by expansion of the gas originally in solution in the oil."

Venezuela

Output gained 31 million barrels last year; 521 wells completed

C. C. McDermond, Maracaibo, presented by proxy a wealth of information on Venezuelan oil developments which could leave no doubt in the minds of those present that the republic will continue to be an important factor in world oil affairs, both as regards production and drilling activities.

The paper was accompanied by maps of the principal producing areas of the country, spotted up to January 1, 1938.

Venezuela's production in 1937 amounted to 186,653,916 barrels, as compared with 155,228,982 barrels in 1936, or nearly five times the amount of increase in 1936 production over that of 1935. Of the 1937 production, Lagunillas field contributed 45.6 percent; Tia Juana, 14.3 percent; Quiriquire, 14 percent; La Rosa, 13.3 percent, and Mene Grande, 7.6 percent.

Of the above total production for Venezuela in 1937, Shell interests contributed 37.4 percent; Lago Petroleum Company contributed 32.3 percent; Gulf Oil Corporation subsidiaries contributed 14 percent, while Standard Oil Company of Venezuela contributed 16 percent. The balance was produced by smaller companies. At the end of the year 2491 wells were producing, of which 1291 were pumpers. The 1937 production figure, incidentally, is a new peak for Venezuelan output.

For the last 20 years, 1917-37, Lagunillas has produced 50 percent of Venezuelan oil; La Rosa, 21 percent; Mene Grande, 13 percent; and Quiriquire, 6.5 percent.

Total accumulated production of Venezuela, according to McDermond, is more than 1,500,000,000 barrels. Current contributors to the cumulative production for 1938 consists of the aforementioned pumpers and flowing wells, plus 275 on air or gas lift.

Venezuela recorded another high in 1937 when exports of crude totaled 171,217,920 barrels. In the order of their contributing importance, fields furnishing oil for foreign consumption were Lagunillas, 53 percent; La Rosa, 21 percent; Mene Grande, 10 percent.

Lago Petroleum Company and Mene Grande Oil Company curtailed production during the last few months of 1937.

Complete 512 Wells

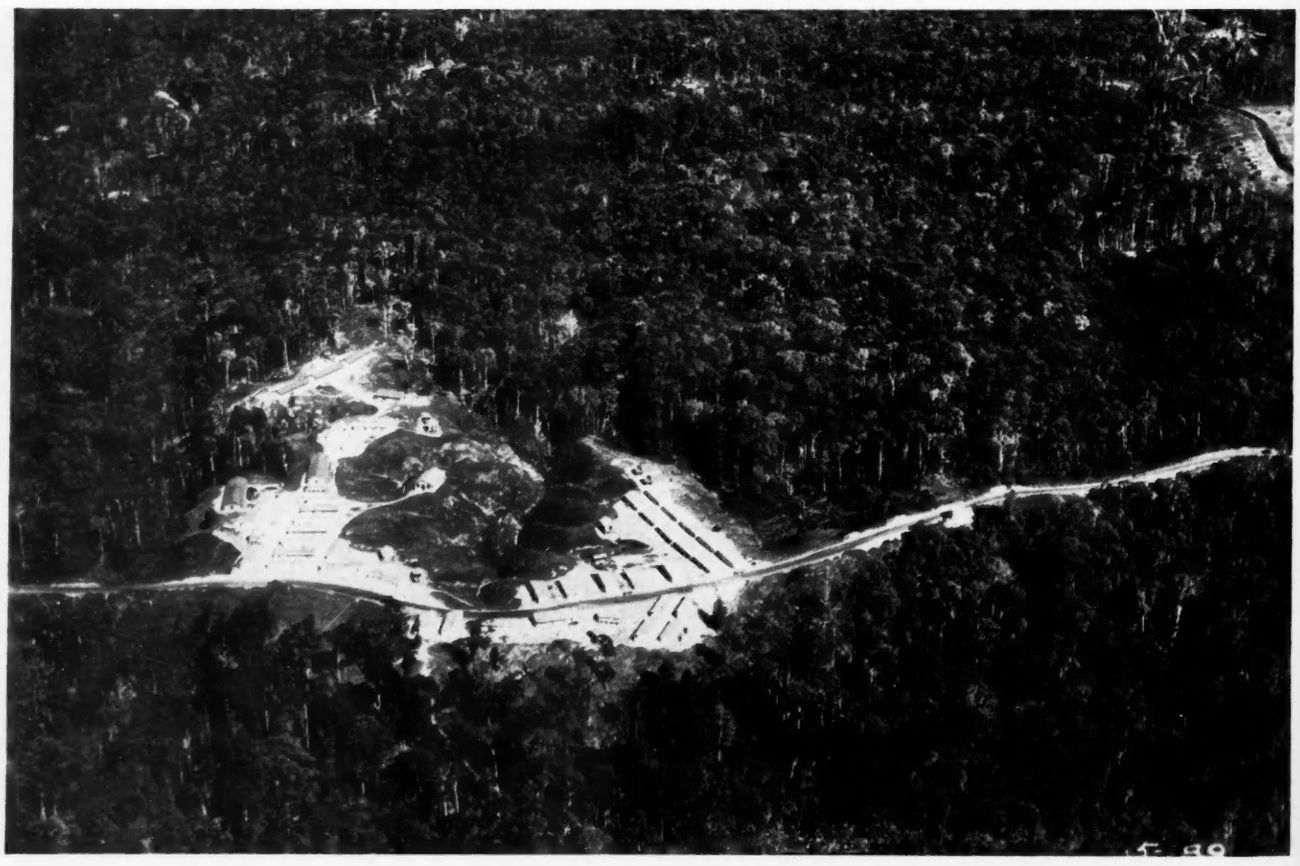
McDermond stated 512 wells were completed in Venezuela in 1937, explaining why more wells were on production at the end of that year than at the end of 1936. Cumulative completions for Venezuela total 3896. Actually, approximately 64 percent of these were on production as 1938 opened. Venezuela's peak year, insofar as the number of completions is concerned, was in 1929, when 595 wells were completed.

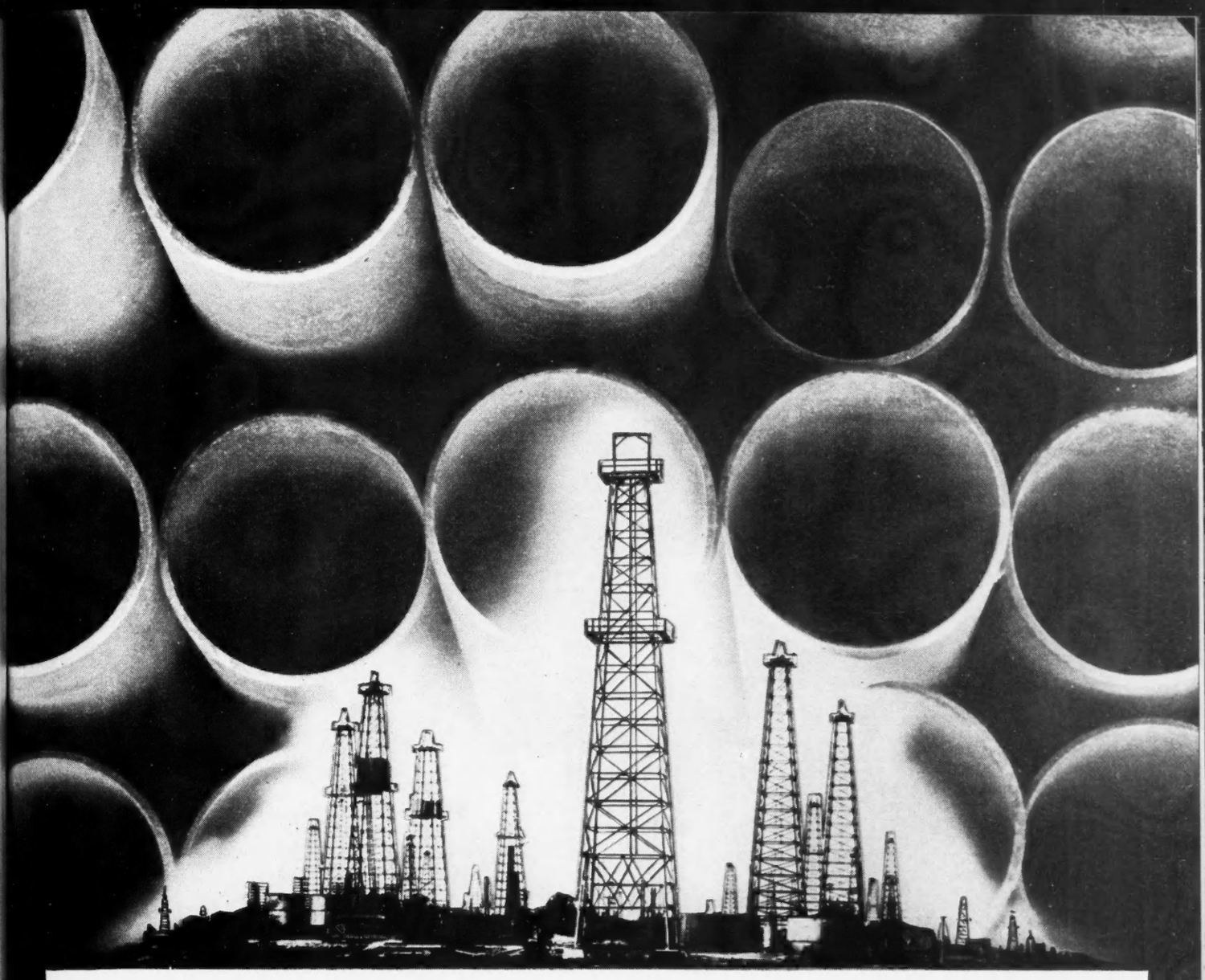
Distribution of the 1937 completions was as follows: Dutch-Shell, 217; Lago Petroleum Company, 125; Mene Grande Oil Company, 90; and Standard Oil Company of Venezuela, 76. The remaining four were completed by British Controlled Oilfields, Limited.

Ambrosia, El Mene, La Paz, Concepcion, Rio de Oro, Totumo, Las Palmas, Pedernales, Orocual, Urumaco, Guanoco, and Netick reported no completions during the year. However, considerable drilling is apt to take place in 1938, McDermond says, in the Bachaquero and Pueblo Viejo areas south of Lagunillas, as well as in Eastern Venezuela.

Cumarebo field, operated by Standard Oil Company of Venezuela, with North Venezuelan Petroleum Company holding nearly 27 percent royalty, maintained actively one string of tools during 1937. Thirteen wells were completed, 12 of which were producers, seven flowing and five being put on the pump. Average completion depth was 1100 feet, with three exceptions, which averaged 635 feet. Most of these

Airplane view of Quiriquire, Venezuelan camp





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wells were good for about 325 barrels daily. New drilling was unable to counteract the decline of this field in 1937. The one-string program will continue throughout 1938, with additional wells being equipped for pumping early in the year. Mene Grande field, wholly operated by Caribbean Petroleum Company, subsidiary of the Royal Dutch Shell group, began 1937 with a three-string program, but later in the year added enough to keep seven rigs busy, five being used on new wells and two on workover jobs. Completions in 1937 totaled 17, most of them in the western half of the field. As considerable of the 1937 drilling was in new territory, Mene Grande's productive area was increased during the year. Minimum completion depths at Mene Grande are around 1735 feet; maximum depths, 4750 feet, with the average well brought in at about 3750 feet. Initial production per well averaged about 975 barrels of 21.3 gravity oil.

Mene Grande produced 14,264,442 barrels in 1937 as compared with 15,428,454 barrels in 1936, reflecting the fluctuating production quota it is subject to as one of the Shell's reserve fields. Only 17 wells in the field were on the pump at the end of 1937. Seven strings will drill during the first half of 1938, five on new projects, two for workovers.

Tarra field in Venezuela, being exploited by Colon Development Company, Limited, also a subsidiary of the Royal Dutch Shell group, had been idle from September, 1934, to June, 1937, but two wells were completed in the latter part of 1937, and the close of the year found one rig busy on a new well and another working over an old producer. Gross intial production for the year was 393 barrels from both completions, both averaging 33 A.P.I. gravity oil. Tarra produced 2,854,377 barrels in 1937, a substantial decline from the 3,412,569 barrels produced in 1936, explaining the resumption of drilling activities, McDermond said. Two strings of tools will continue active in 1938.

Lagunillas is Largest Field

Lagunillas field, Venezuela's greatest, is a three-company proposition. The operators are Venezuelan Oil Concessions, Limited, Lago Petroleum Company, and Mene Grande Oil Company. The first completed 67 wells in 1937, most of which yielded 15.5 gravity A. P.I. oil. Lago completed 18 yielding an average of 13.8 gravity A.P.I. oil. Mene Grande completed 17 wells in the northern section of Lagunillas to obtain a yield which averaged 14.5 gravity oil. Flush production in this field is rapidly declining, and a number of the recent completions have had to be put on the pump. Lagunillas, the author pointed out, had a cumulative production of 85,024,111 barrels to the end of 1937.

Tia Juana field in Venezuela is controlled by the same three majors that control Lagunillas. It had an active offset campaign during 1937, each company having five strings working at the opening of the year. Venezuelan Oil Concessions completed 108 wells there during 1937—each having an average initial production of 590 barrels and yielding, as a rule, 14.6 A.P.I. gravity oil. Lago Petroleum Corporation completed 69.

Average depths of wells completed in Tia Juana in 1937 were, according to McDermond: Eocene, 3200 feet; Lower Lagunillas sand 3200 feet. Average initial production of the field's completions was 1110 barrels, and the average gravities ranged from 23 A.P.I. gravity down to 16.3. Lago plans to use five drilling rigs in the field in 1938.

Mene Grande Oil Company, formerly Venezuela Gulf Oil Company, completed 64 Tia Juana wells in 1937. Average depth of the wells drilled was 2400 feet; average initial production each, 770 barrels; average gravity, 14.5 A.P.I.

To offset the rapidly declining flush, it is said a large pumping program is contemplated by the three operators for 1938.

Resumption of drilling in Los Manueles field by Colon Development Company, Limited, took place in April, 1937, after suspension late in 1934. Only one well was completed: initial, 1965 barrels; depth, 4068 feet; gravity, 26.5 A. P. I. The field produced slightly over a million barrels in 1937, increase of better than 25 percent over 1936 production. Pumping has not started in Los Manueles, where one string will operate in 1938.

Referring to La Rosa and Punta Benitez fields, the author said Venezuelan Oil Concessions, Limited's, only well in the area was a commercial disappointment. Mene Grande Oil Company, however, completed nine wells, their average depth being 1850 feet and their average initial production, 300 barrels. Lago completed 32 wells in Punto Benitez field for an average initial production ranging from 400 to 900 barrels. In La Rosa, Lago drilled six wells in 1937. Five of these averaged 70 barrels each daily, while one initialled 950 barrels. Average depth of La Rosa completions of Lago was 2675 feet, while the gravity averaged 25.5 A.P.I.

La Rosa and Punto Benitez are not expected to be highly active during 1938, McDermond said.

Venezuelan Oil Concessions, Limited, was the only company to actively engage in drilling in Ambrosio and North La Rosa fields during 1937, and it confined drilling to the Ambrosio area of the district. Seventeen wells completed during the year having an average depth of 1850 feet and an average daily yield of 145 barrels of 22.6 gravity oil. This company is expected to keep two rigs busy in the field during the first half of 1938.

Australia

Small amounts of heavy oil were discovered in Gippsland district

DR. W. G. WOOLNOUGH of Canberra, F.C.T., sent the foreign production symposium gathering a paper dealing with "Oil Prospecting in Australia During 1936-1937", which was presented in briefed form.

In explaining the apparent slow progress of the search for oil in Australia, Dr. Woolnough brought out that while that continent's area is about equal to that of the United States, the population is only 7,000,000, most of which is concentrated on the east and southeast coasts. With much of the country accessible, from a practical angle, only by airplane, elemental transportation problems involved in preliminary reconnaissance work are most difficult, and progress in covering any likely inland area is necessarily slow. Most of the country's interior is arid and waterless, there being one great stretch of country about the size of the Mississippi drainage area of the United States without a single flowing stream and with an annual rainfall of less than seven inches over most of it.

Austrialia consists of six states, each of which retains control of lands and mineral rights and has its own petroleum legislation—a complicated situation for prospecting. There are, in addition, three federal territories, each with different mineral legislation. These are the Northern Territory, between the northern parts of Queensland and Western Australia states, and the two comprising the island of New Guinea called Papua and New Guinea.

Notwithstanding the average Australian was left eerie after the orgy of company flotation in the late twenties, he inherited from the resultant indiscriminate drilling definite indications of oil in three of the states and two of the territories, the paper said.

There has, however, been a revival of interest in oil in the last two years, with the New Guinea territories and most of the states passing new petroleum legislation which, though far from perfect, is a pronounced improvement over the old, Dr. Woolnough stated. An operator in Queensland can have at one time only two 2500-acre tracts in the state. Victoria also puts too much restriction on the amount of acreage a company may have under lease. Western Australia legislation recognizes the necessity of allowing a company sufficient time and ground for preliminary work, but the size of the "reward leases" it provides for after picking a structure is not sufficiently large to encourage exploitation. But Papua and New Guinea have made it worthwhile to the financially able explorer, new laws allowing the granting of concessions up to 30,000 square miles in size but imposing obligation for definite expenditures in the way of development.

After discussing the petroleum legislation at length, Dr. Woolnough's paper summarized results of drilling in the Australian states and territories.

"Small amounts of heavy oil, suitable as lubricating oil, but devoid of gasoline and kerosene fractions, were discovered in the Gippsland district of eastern Victoria in 1937. Twenty-eight

[*Continued on page 208*]

NG EQUIPMENT

1 No. C-250 POWER DRIVEN SLUSH PUMP

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C-150, 6¾ x 12", 150 H. P.	17,935 lbs.,	2,000 lbs.
D-50, 5 x 10", 50 H. P.	6,035 lbs.,	1,000 lbs.

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3 No. 34-26-BDF DRAW WORKS

A heavy duty, 3-shaft, 4-speed, Unit Type Draw Works having solid welded end frames with bearing boxes welded in, and mounted on heavy structural steel base. The base frame can be furnished without extension beyond side frames, or with one end extended, as illustrated, or both ends extended to total length of 18 feet. This type of construction combines ease of transportation and installation.

Various optional features of design include—Machine Cut Sprockets with positive lubrication to all chains; Compound Equalizing Brakes with centralized lubrication; Water Cooled Brake Rims; provision for mounting Hydromatic Brake with Idler Sprocket on Rotary Drive. Several combinations of drums and brake rim sizes are available—26" dia. Drum with 46" Rims; 26" dia. Drum with 54" Rims, and 30" dia. Drum with 54" Rims. Gross weight prepared for export, 30,735 pounds.

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Production Rising

World output in 1938 probably will exceed all-time peak reached in 1937, as further expansion of oil consumption is indicated

By L. J. LOGAN
Associate Editor

STIMULATED by the largest consumption in history, world production of crude oil reached a new all-time peak of 2,021,171,000 barrels in 1937, going for the first time above 2,000,000,000 barrels, and exceeding 1936 output 13.1 percent.

Toward this setting of a new record, most of the countries of the world contributed, numerous nations having established new all-time peaks, while all but a few produced more than in 1936.

New Peaks Reached

New all-time peaks of production were reached in 1937 in 8 of the 12 leading producing countries, including the United States, U. S. S. R. (Russia), Venezuela, Iran (Persia), Netherlands India, Iraq, Argentina, and Trinidad; while new records were established also in Bahrein Island, an increasingly important producing country, and in Germany, Canada, and Ecuador.

In addition to these countries that produced more crude oil in 1937 than ever before, several others yielded more in 1937 than in 1936, although failing to equal previously established all-time peaks. They included Mexico and Colombia, two of the 12 leading producing countries, and India (British), Japan, France, Sakhalin and Italy.

Mexico's production of 46,000,000 barrels was about 5,000,000 barrels larger than in the previous year, but it was smaller than in the 12-year period, 1917-1928, the 1937 output having been only about one-fourth as high as the 1921 all-time peak.

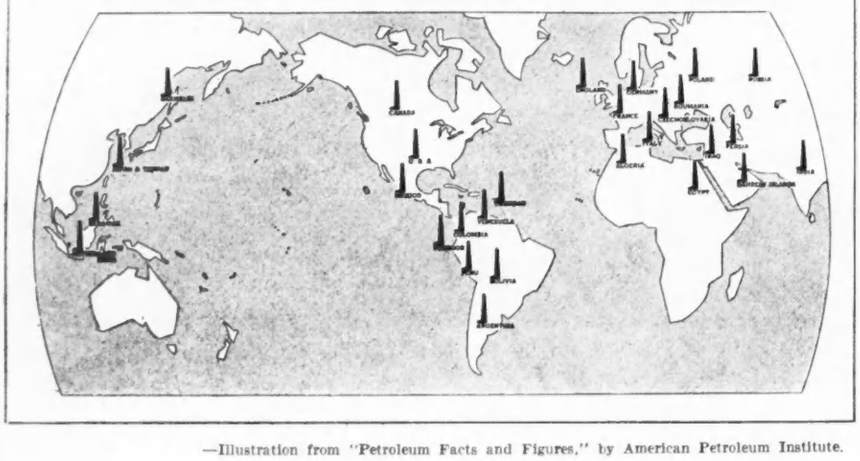
Some Countries Decline

Running counter to the general upward trend, several countries in 1937 showed declines in production. Among them were Roumania and Peru, two of the 12 leading producing countries, British Borneo, Poland, Egypt, Czechoslovakia and Bolivia.

Producing approximately 53,100,000 barrels, Roumania showed a decline of over 10,000,000 barrels from the all-time peak that was reached in 1936.

Peru, however, failed by only a

WORLD'S OIL-PRODUCING COUNTRIES



—Illustration from "Petroleum Facts and Figures," by American Petroleum Institute.

As Demand Grows

small margin to equal the all-time peak it had established in 1936, the 1937 output having been about 17,455,000 barrels.

After having set an all-time record of 5,389,000 barrels in 1935, British Borneo declined somewhat in 1936 and a little further, to 4,500,000 barrels, in 1937.

Poland's decrease was a continuation of the steady decline that had been under way since 1909. The country produced in 1937 about 3,485,000 barrels, remaining ahead of Germany, Japan and Canada.

Algeria's small production in 1937 was about the same as that in 1936.

New Peak in 1938 Likely

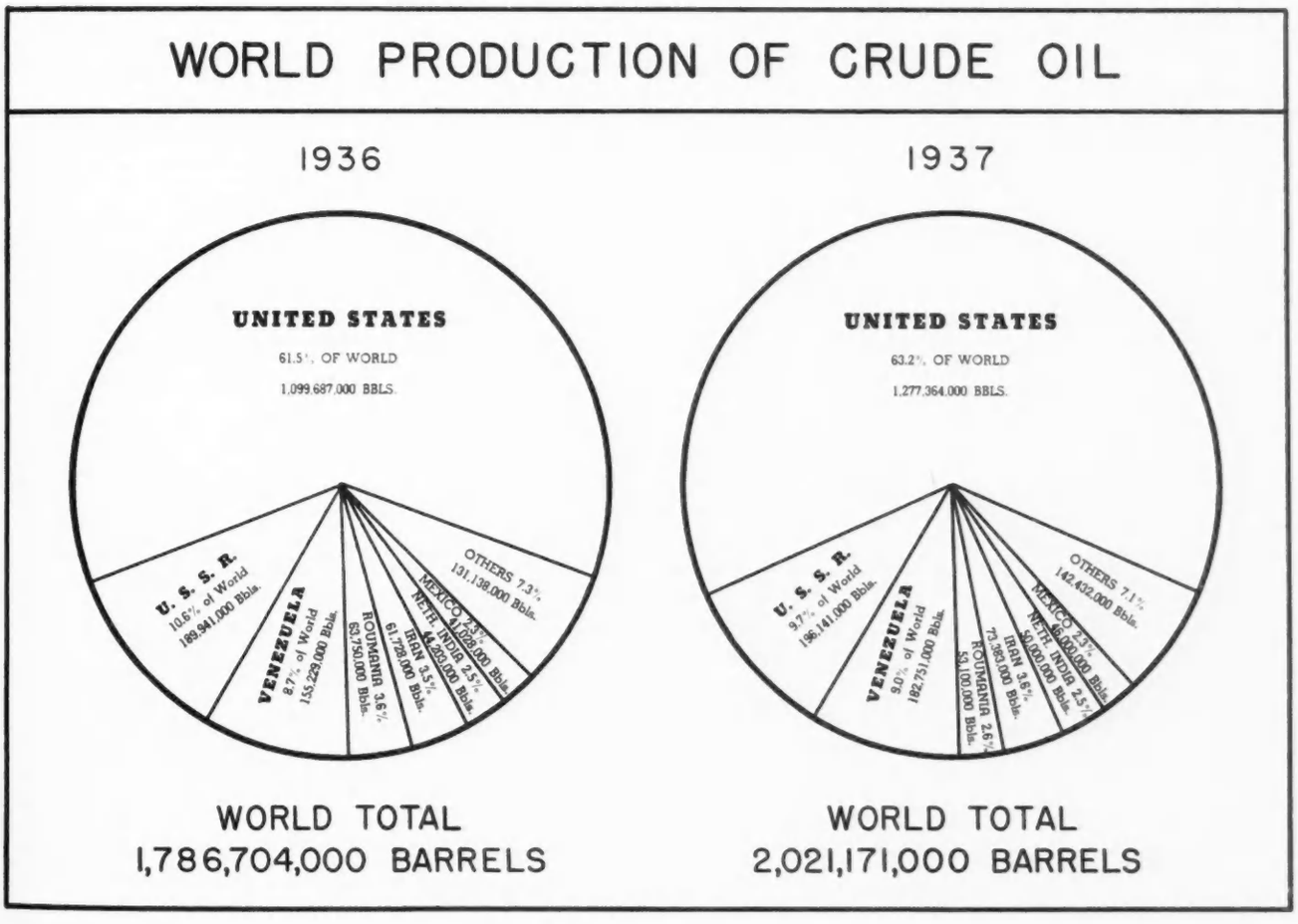
Despite the setting of a new record in 1937, world production very likely will rise further in 1938 and again reach a new all-time peak.

For world consumption of petroleum in recent years has been increasing consistently and sharply, and probably will expand further this year, unless a severe world-wide depression develops; and world production normally conforms closely with the world demand.

U. S. Increase Probable

In the United States, crude oil production in January, 1938, was 8.3 percent larger than in January, 1937, despite exceptionally strict proration. And it is widely believed that demand for 1938 as a whole will be larger than in 1937, a 5 percent increase being considered a conservative forecast. Consequently, it is indicated that United States production for the year is likely to be around 5 percent larger than in 1937.

Inasmuch as it has been producing over 60 percent of the world



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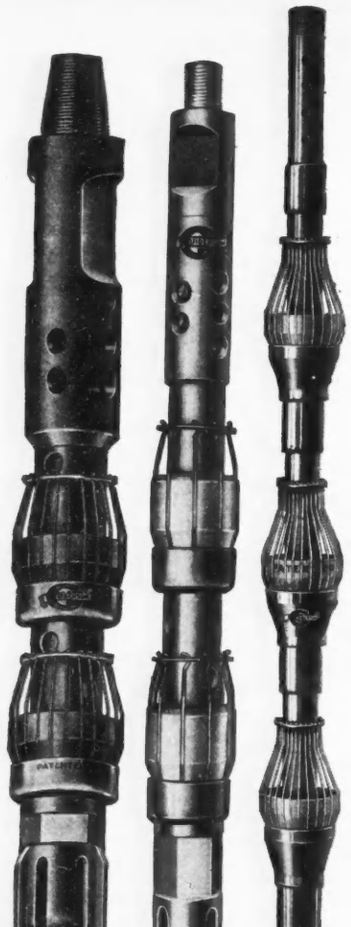
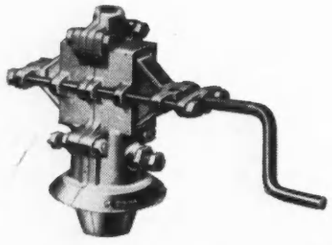


GUIBERSON SWABS

Patented

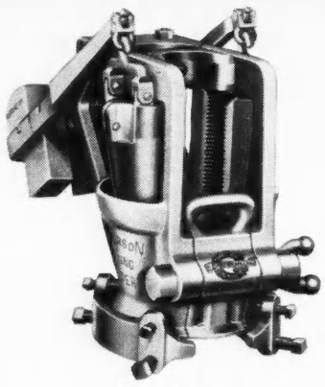
The GUIBERSON Swab is the only swab constructed on the correct principle, flexible cups yielding to by-pass fluid and obstructions running in, but being pressed tight against pipe by fluid pressure, coming out. Advantages: 1. Raises full loads; 2. Cups yield to pass projections and paraffin —will not stick; 3. Runs in faster; 4. Special composition cups protected by steel wires, wear longer; 5. Less wear on tubing and casing. Type K Casing and Tubing Swabs and Type A Swab are shown.



WIRE LINE OIL SAVER

Patented

The GUIBERSON Wire Line Oil Saver is the outstanding device of its kind. Its patented method of adjusting both rubbers simultaneously and uniformly by turning one crank insures equalized pressure and uniform wear on rubbers. 500 pounds test. Easiest to operate. Perfected in every detail.



Heavy Type

TUBING SPIDERS

The GUIBERSON Tubing Spider offers two outstanding advantages; its new patented Guide Head for guiding tubing to exact center of spider's bore, and its lever for full control of slips by one man. Heavy type handles 2″ to 4″ tubing in any depth well. Medium Type handles 2″ to 3″ tubing, will support 5000 feet of 3″ upset tubing.

Type E — Type B

TUBING CATCHERS

GUIBERSON introduced the automatic tubing catcher and offers the world's most complete and highly perfected line. Type E is for wells of any depth—Type B for wells under 4,000 feet—Type C for wells with faulty or thin casing. A few advantages: 1. Slips of larger and ample size operate accurately on dovetail tracks; 2. Load-Carrying parts are heat-treated alloy steel; 3. Special non-fatiguing spring; 4. Largest by-pass area. In pumping wells we recommend use of GUIBERSON Tubing Catcher Anchor, with catcher, for increased pumping efficiency.

Type C-1 — Type G-1 — Type GT

CONTROL HEAD PACKERS

Patented

GUIBERSON patented Control Head Packers possess several exclusive advantages: 1. Valve at top permits running in against heavy flows, oil and gas passing upward through packer; 2. Passage can be opened through packer at will, after setting, by simply raising tubing; 3. Packer can be reset higher or lower at will; 4. No swabbing effect, coming out, as valve opens; 5. Neoprene packing used with G Packers and optional with C-1 is oil resisting and will not stick. Types shown are C-1, with single rubber of graphited rubber or Neoprene; G-1 with two rubbers of Neoprene; and GT Type, similar to G-1 but with 30″ valve opening. The 2-rubber packers offer a new advantage as when packer is set the backs of metal parts which hold the rubbers are in contact with each other and carry the tubing. In Type GT the 30″ valve opening eliminates nozzling effect, also allows valve to be opened after packer is set without changing position of packer.

GL

SPECIAL PACKERS

The Type GL Control Head Liner Packer and the Type GA Control Head Anchor Packer are designed to answer the need for inexpensive packers of control-head type for use respectively in packing off casing in wells equipped with liners, and in packing off casing or open hole with anchor in bottom of well.

All parts of both packers are interchangeable with parts of the Type G-1, with the exception of mandrel. Two separate short rubber sleeves are used for packing medium and are made of oil-resisting, non-sticking Neoprene. Upset tubing is used throughout.

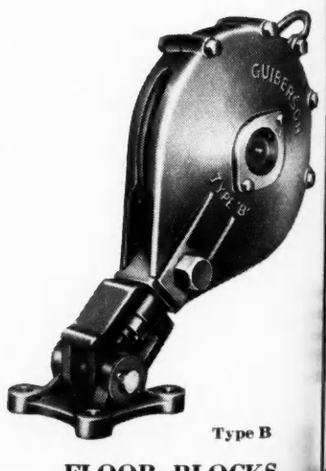
While running either packer in hole, top valve is held open by a spring, thus allowing ample by-pass for fluid or gas between packer shell and tubing and through valve. This allows packers to run against high pressures, and to release fluid load avoiding swabbing effect when pulled.

GA

SUCKER ROD STRIPPER

Patent Pending

The GUIBERSON perfected Sucker Rod Stripper provides a positive seal against escape of oil and gas, when running in or pulling rods. Strips paraffin as well as oil from rods and couplings. Specially developed rubbers are long-lived. Two sizes of rubbers handle all sizes of rods.



Type B

FLOOR BLOCKS

Advantages of GUIBERSON Floor Blocks are: 1. They stand up on floor (lateral movement is only 45 degrees each way); 2. Frames can be set over line without threading line through block; 3. Sheaves rotate on roller bearings; 4. In Type B, frame forms complete safety guard. Type A-1 has 16¼″ O.D. cast steel sheave with ⅞″ A.P.I. machined groove. Type B has 22″ O.D. cast steel sheave with 1″ A.P.I. machined groove. Capacities ample for wells up to 7000 feet.

See GUIBERSON Complete Catalog, in Composite Catalog

THE GUIBERSON CORPORATION

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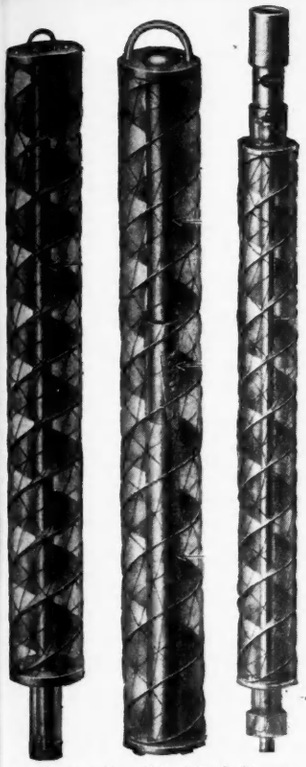


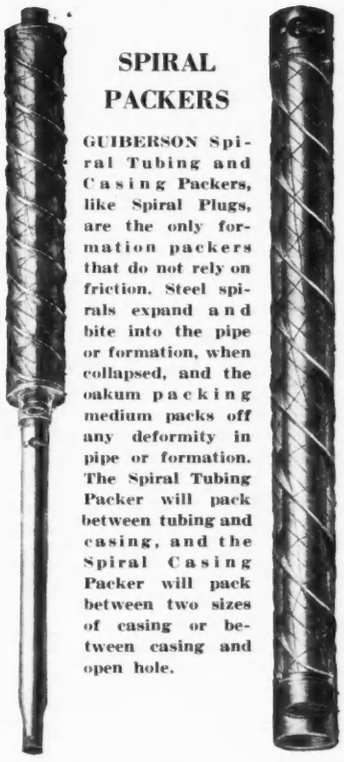
Standard Collapsible Wash-Down

screwed in bottom plate permit core to pass downward through socket when plug is collapsed to set, but prevents it moving upward. Three types are offered, as shown; Standard, for setting a few feet off bottom of well; Collapsible Core, for setting directly against bottom of well; and Wash-Down Type through which water may be circulated to wash out hole before setting plug.

SPIRAL PLUGS

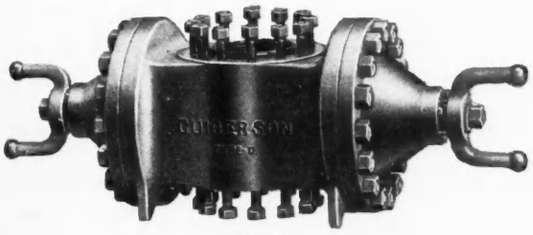
Patented

The GUIBERSON Spiral Bottom Water Plug has been uniquely successful because its spirals, when collapsed, expand laterally and take a screw-like bite into the walls of the well instead of a mere friction grip. Oakum is used as packing between the boiler-plate spirals. Slips in Anchor Socket



SPIRAL PACKERS

GUIBERSON Spiral Tubing and Casing Packers, like Spiral Plugs, are the only formation packers that do not rely on friction. Steel spirals expand and bite into the pipe or formation, when collapsed, and the oakum packing medium packs off any deformity in pipe or formation. The Spiral Tubing Packer will pack between tubing and casing, and the Spiral Casing Packer will pack between two sizes of casing or between casing and open hole.



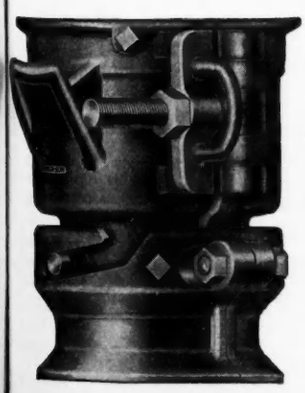
Type D

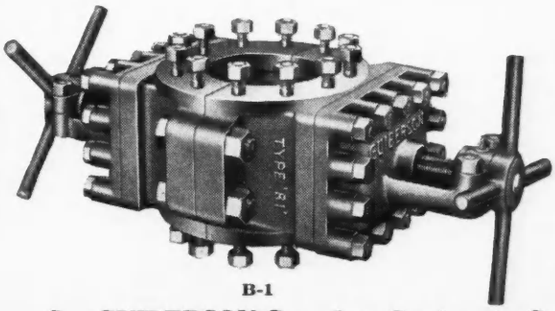
PRESSURE DRILLING EQUIPMENT

GUIBERSON "drilling-in-under-controlled-pressure" completion equipment enables the operator to drill low-pressure sands and highly permeable lime formations employing the use of oil, a mixture of oil and gas, or gas alone, as a circulating column. The low-pressure set-up (left) consists of GUIBERSON Type A Friction Kelly Drive, which fits any standard make of rotary and has special non-slipping, non-scarring gripping arrangement to fit flush joint or standard drill pipe—and a GUIBERSON Type D High-Pressure Tubing Oil Saver. The high-pressure set-up (right) consists of a GUIBERSON Type B Collapsible Friction Kelly Drive, a GUIBERSON Type C Drilling Head, constructed to withstand 3000 lbs. test pressure, a Quick-Detachable Coupling, and GUIBERSON Type D Oil Saver. The Type C Drilling Head is designed to fit around a 3½" O.D. round Kelly or drill pipe, but can be furnished for smaller diameters also. Packing medium rotates thus eliminating wear.

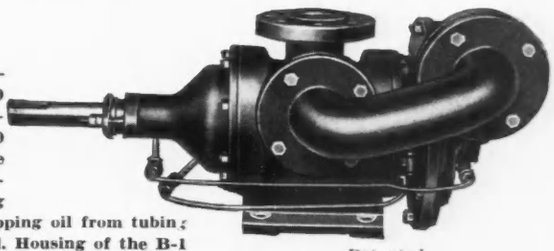
DRILL PIPE AND TUBING OIL SAVERS

GUIBERSON stands alone in having perfected a complete line of oil saver equipment for high pressure wells. GUIBERSON savers quickly pay for themselves through making possible improved production methods and saving oil. Furthermore, by making a positive seal around drill pipe or tubing and eliminating any loss of oil, they (1) prevent fires by keeping oil from scattering; (2) prevent oil-soaked, slippery derrick floors which cause injuries to men. Four types are offered: B-1 for pressures up to 400 lbs.; C-2 for pressures up to 600 lbs.; D for pressures up to 1,500 lbs.; and the GUIBERSON Tubing Stripper for stripping oil from tubing when it is pulled. Housing of the B-1 is in two pieces for easy assembly around pipe. Housings of the C-2 and D are of alloy cast steel in one piece for extra strength. Special rubbers of a durable, oil-resisting compound permit easy passage of pipe collars and are easily changed. Adapters to fit any type hook-up.





B-1



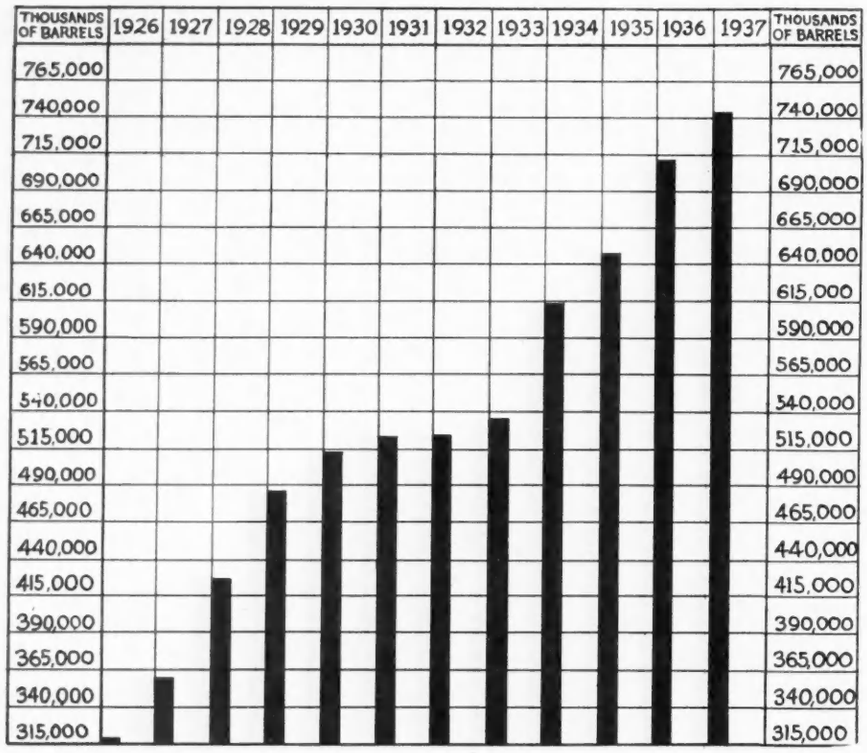
Patented

ROTARY PUMP

The new GUIBERSON Rotary High-Pressure Pump meets the demand for a pump with high efficiency over a wide range of speeds and pressures. Among its advantages are: 1. Direct drive, without gears; 2. Fewer wearing parts; 3. Less packing; 4. Adaptable for gasoline or Diesel engine or electric drive; 5. High efficiencies up to 1000 lbs. or more; 6. Operation at sustained high speed; 7. Non-pulsating discharge; 8. No trapping.

See GUIBERSON Complete Catalog, in Composite Catalog

Annual Crude Oil Production of Countries Outside the United States Steadily Increasing



output, the United States has been determining the trend of world production. In the recent depression years, for instance, decreases in United States production resulted in declines in world output. And in the subsequent recovery years, when United States production resumed the upward trend, world totals also began to rise again.

Outside the United States, aggregate production has been following but one trend in recent years, through fat years and lean, rising consistently every year. That trend is shown in an accompanying chart.

Similarly, it is to be expected that the countries outside the United States will show, in the aggregate, a further increase in production in 1938, to a new all-time peak.

The importance which oil production is assuming in countries outside the United States is indicated impressively by comparing that production at present with the output in the United States a few years ago.

The United States in recent years has been producing over 60 percent of world output, and the other countries together less than 40 percent.

Yet the production of countries outside the United States, having risen steadily in recent years, amounted in 1937 to 743,807,000 barrels. That was almost as much oil as the United States production in 1932, which totaled 785,159,000 barrels.

Outlook for U. S. S. R.

Prospects for production in 1938 vary, of course, among the individual countries.

U. S. S. R. (Russia), second largest oil producing country, may be expected to show at least some further increase in production in 1938, similar to gains in recent years. The 1937 output of 196,141,000 barrels was about 3 percent larger than that of the previous year. The country is rich in undeveloped oil reserves, and geological and geophysical activities have pointed out numerous promising prospects in addition to the fields already in the process of development. There is, however, a lack of efficient organization in drilling, and the country has been having difficulty in materially expanding its crude oil production. In 1937 the production failed to increase in proportion to the gain in domestic consumption, and it was necessary to permit exports to decline. A similar situation appears likely for 1938. But the steadily growing Russian consumption may be expected to serve as a spur to production. And some further rise in production is likely.

Venezuelan Gain Probable

Venezuela in 1937 crowded Russia for second place among the oil producing countries of the world, running a strong third, and it now appears quite possible that Venez-

Rank of Countries in All-Time Crude Oil Production Changes in 1937, as Iran, Iraq, and Bahrein Island Move Upward

Present Rank (In Production for 1857-1937)	COUNTRY	Barrels Production, 1857-1937	Percent of World Total, 1857-1937	Rank Year Ago (In Production for 1857-1936)
1	United States	19,972,090,719	64.11	1
2	U. S. S. R. (Russia)	3,771,601,907	12.11	2
3	Mexico	1,863,975,162	5.98	3
4	Venezuela	1,491,320,000	4.78	4
5	Iran (Persia)	788,034,000	2.53	7
6	Roumania	780,390,176	2.50	6
7	Netherlands India	777,872,621	2.49	5
8	British India	273,663,365	0.88	8
9	Poland	250,998,251	0.80	9
10	Peru	222,562,855	0.71	10
11	Colombia	205,863,000	0.66	11
12	Argentina	169,284,001	0.54	12
13	Trinidad	144,553,391	0.46	13
14	Iraq	100,988,000	0.32	16
15	British Borneo	77,956,000	0.25	14
16	Japan and Taiwan	75,265,035	0.24	15
17	Canada	40,770,770	0.13	17
18	Germany	37,417,041	0.12	18
19	Egypt	31,968,000	0.10	19
20	Sakhalin	22,149,000	0.07	20
21	Ecuador	17,940,000	0.05	21
22	Bahrein Island	14,826,000	0.04	23
23	France	9,734,000	0.03	22
24	Italy	2,542,718		24
25	Czechoslovakia	2,197,000		25
26	Bolivia	719,000	0.02	26
27	Algeria	149,000		27
28	England	20,000		28
	Others	2,731,000	0.08	
	Total	31,149,582,012	100.00	

Power for PURE OIL Progress

- Pure Oil Company's production in Illinois has called for many of these Type G-SD, 40 to 60 hp, vertical gas engines.
- G-AW twin-cylinder gas engines, rated 100 to 140 hp, are used by The Pure Oil Company to drive pumping powers in many of its fields.
- Type JT, 6-cylinder, Diesel engines, rated 300 hp at 327 rpm, drive duplex reciprocating pumps at the Toledo and Heath, Ohio, refineries.
- Five of these Type G-DQ, 150 hp, twin-cylinder gas engines, drive naptha and hot-oil pumps at the Toledo refinery.
- Type G-MG, gas-engine-driven compressor units, rated 50 hp at 300 rpm, operate in The Pure Oil Company's Van, Texas, stations.

In the past quarter of a century, it has been our privilege to furnish many engines for the far-flung operations of The Pure Oil Company. Acceptance by such an alert and progressive organization is surely a tribute to the economical and trustworthy performance of Cooper-Bessemer engines and compressors. We are proud to have had such a share in The Pure Oil Company's progress and development.

33 . . . 1938

COOPER CB CORP BESSEMER

THE COOPER-BESSEMER CORPORATION

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201 East 1st Street, Tulsa, Oklahoma
631 Spring Street, Shreveport, La.
Magnolia Building, Dallas, Texas
Esperson Building, Houston, Texas

105 YEARS OF KEEPING PACE WITH INDUSTRY

Rank of Leading Oil Producing Countries, Same in 1936 as in 1935, Changes in 1937, as Iran Moves Ahead of Roumania

1937			1936			1935		
Rank and Country	Barrels Production	Percent of World Total	Rank and Country	Barrels Production	Percent of World Total	Rank and Country	Barrels Production	Percent of World Total
1. United States	1,277,364,000	63.2	1. United States	1,099,687,000	61.5	1. United States	996,596,000	60.4
2. U. S. S. R.	196,141,000	9.7	2. U. S. S. R.	189,941,000	10.6	2. U. S. S. R.	182,386,000	11.1
3. Venezuela	182,751,000	9.0	3. Venezuela	155,229,000	8.7	3. Venezuela	148,529,000	9.0
4. Iran (Persia)	73,383,000	3.6	4. Roumania	63,750,000	3.6	4. Roumania	61,371,000	3.7
5. Roumania	53,100,000	2.6	5. Iran (Persia)	61,728,000	3.5	5. Iran (Persia)	57,304,000	3.5
6. Netherlands India	50,000,000	2.5	6. Netherlands India	44,203,000	2.5	6. Netherlands India	42,319,000	2.6
7. Mexico	46,000,000	2.3	7. Mexico	41,028,000	2.3	7. Mexico	40,241,000	2.4
8. Iraq	31,171,000	1.5	8. Iraq	29,406,000	1.6	8. Iraq	27,311,000	1.7
9. Colombia	20,006,000	1.0	9. Colombia	18,756,000	1.0	9. Colombia	17,598,000	1.1
10. Peru	17,455,000	0.9	10. Peru	17,595,000	0.9	10. Peru	17,067,000	1.0
11. Argentina	16,300,000	0.8	11. Argentina	15,455,000	0.9	11. Argentina	14,295,000	0.8
12. Trinidad	15,500,000	0.8	12. Trinidad	13,237,000	0.8	12. Trinidad	11,671,000	0.7
Others (chiefly 14 countries)	42,000,000	2.1	Others (chiefly 14 countries)	36,689,000	2.1	Others (chiefly 14 countries)	33,470,000	2.0
World Total	2,021,171,000	100.0	World Total	1,786,704,000	100.0	World Total	1,650,158,000	100.0

uela may surpass Russia in 1938. The Venezuelan production for 1937 totaled about 182,751,000 barrels, or nearly 18 percent more than 1936 output, and an increase of similar percentage is likely in 1938. Wildcatting in the country is beginning to bear fruit, and the political conditions, unlike those in some other countries, are encouraging.

Iran Development Conservative

Iran (Persia), formerly fifth largest oil producing country, stepped up into fourth place in 1937, as output increased 19 percent, while there was a decline in Roumania, previously the fourth producing country. The Iran production in 1937 totaled about 73,383,000 barrels. Iran probably will continue in 1938 as the fourth largest producing country and show a further moderate increase, although conservative drilling is expected to continue.

Roumanian Situation

Roumania quite possibly may show a further important decline in production in 1938, following a serious drop in 1937. The country in 1937 produced about 53,100,000 barrels, or 20 percent less than in 1936. And although dropping only from fourth to fifth place among the oil countries, Roumania did not stay comfortably ahead of Netherlands India and Mexico in 1937. One or both of those competitors may forge ahead of Roumania in 1938, in which event Roumania would drop from fifth into sixth or seventh place among the oil producing countries.

New laws and political policies have been largely responsible for the decline in Roumania's importance as an oil producing country. Royalties are excessive, and the method of granting concessions is unfavorable to oil companies. There has been agitation for more encouraging laws, but success does not appear likely.

Netherlands India

Netherlands India, sixth largest producing country in 1937, showed an increase of nearly 14 percent in yielding about 50,000,000 barrels. The production there has been consistently increasing by moderate steps over a long period, and may be expected to continue doing so.

Prospects in Mexico

Mexico registered an increase of 12 percent, as production rose in 1937 to about 46,000,000 barrels. The gain occurred despite friction between oil companies and the government and between labor and the company managements. If political troubles are ironed out and private initiative is reinstated, production may increase substantially further in 1938. There have been some indications lately of more conservative policies of the government toward the oil companies, indicating that increased production may be encouraged.

Iraq Near Capacity

Iraq, eighth largest producing country, likely will continue in that same rank in 1938, with about the same output as in 1937, which was approximately 31,171,000 barrels. The country has only one market outlet, the pipe line system, and it has been operating at capacity.

Outside Venezuela, South American countries face varying prospects. Colombia and Peru, ninth and tenth, respectively among the oil producing countries of the world in 1937, probably will retain those positions in 1938, as conditions are relatively favorable, politically and economically. In Argentina, eleventh among oil countries, the oil industry has been virtually nationalized, and no important expansion is indicated. Trinidad, Twelfth among the countries, has been showing material increases in production, and probably will continue the upward trend in 1938.

All-Time Production

Several changes occurred during the past year in the rank of oil-producing countries in all-time output, although the four leaders retained their positions.

Rank of Leading Oil Producing Countries Has Changed Materially from 10, 20 and 30 Years Ago

1927			1917			1907		
Rank and Country	Barrels Production	Percent of World Total	Rank and Country	Barrels Production	Percent of World Total	Rank and Country	Barrels Production	Percent of World Total
1. United States	901,129,000	71.4	1. United States	335,315,601	66.7	1. United States	166,095,335	62.9
2. U. S. S. R.	77,018,000	6.1	2. U. S. S. R.	63,072,000	12.6	2. U. S. S. R.	61,850,734	23.4
3. Mexico	64,121,000	5.1	3. Mexico	55,292,770	11.0	3. Netherlands India	9,982,597	3.7
4. Venezuela	63,134,000	5.0	4. Netherlands India	13,180,000	2.6	4. Poland (Galicia)	8,455,841	3.2
5. Iran (Persia)	39,688,000	3.1	5. India (Brit.)	8,078,843	1.6	5. Roumania	8,118,207	3.1
6. Netherlands India	27,459,000	2.2	6. Iran (Persia)	7,147,000	1.4	6. India (Brit.)	4,344,162	1.6
7. Roumania	26,368,000	2.1	7. Poland (Galicia)	6,228,000	1.3	7. Japan and Taiwan	1,718,000	0.6
8. Colombia	15,014,000	1.2	8. Roumania	3,720,760	0.7	8. Mexico	1,005,000	0.4
9. Peru	10,127,000	0.8	9. Japan and Taiwan	2,861,000	0.6	9. Canada	788,872	0.3
10. Argentina	8,630,000	0.7	10. Peru	2,577,000	0.5	10. Germany	756,631	0.3
11. India (Brit.)	8,032,000	0.6	11. Trinidad	1,602,312	0.3	11. Peru	751,000	0.3
12. Trinidad	5,380,000	0.4	12. Argentina	1,218,000	0.2	12. Italy	59,875	0.1
Others (chiefly 13 countries)	16,482,000	1.3	Others (chiefly 8 countries)	2,596,595	0.5	Others (chiefly Argentina)	29,730	0.1
World Total	1,262,582,000	100.0	World Total	502,889,881	100.0	World Total	263,956,355	100.0

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BALDWIN ASK THE DRILLER .. *He Knows*

The United States is far in the lead, having accounted for 64.11 percent of the world's all-time production. U.S.S.R. (Russia) is comfortably in second place, having yielded 12.11 percent of world production from 1857 through 1937. Mexico ranks third with 5.98 percent of cumulative world production, and Venezuela fourth with 4.78 percent.

Iran (Persia) moved in 1937 into fifth place among the countries in all-time production, having yielded 2.53 percent of the cumulative total. Previously, Iran ranked sixth, but in moving into fifth place, it forced Roumania into sixth, the latter having produced 2.50 percent of all world output. Roumania barely held, moreover, ahead of Nether-

World Crude Oil Production, by Countries, by Years

Complete Production History of World, in Barrels of 42 U. S. Gallons

(Sources.—*Mineral Resources* of the United States, 1918, 1930 and 1931; *Minerals Yearbook*, 1932, 1933 and subsequent years. Note: The figures of *Mineral Resources*, 1918, have been replaced here by figures from later reports, in cases where revisions have been made.)

YEAR	Rumania	United States	Italy	Canada	Russia except Sakhalin	Poland (Galacia)	Japan and Taiwan	Germany	India (British)	Netherland India	Peru	Mexico	Argentina	Trinidad	YEAR
1857	[A]1,977	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1857
1858	3,560	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1858
1859	4,349	[A]2,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1859
1860	8,542	500,000	[A]36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1860
1861	17,279	2,113,609	29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1861
1862	23,198	3,056,690	29	[A]11,775	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1862
1863	27,943	2,611,309	58	82,814	[A]40,816	.....	.....	.....	.....	.....	.....	.....	.....	.....	1863
1864	33,013	2,116,109	72	90,000	64,586	.....	.....	.....	.....	.....	.....	.....	.....	.....	1864
1865	39,017	2,497,700	2,265	110,000	66,542	.....	.....	.....	.....	.....	.....	.....	.....	.....	1865
1866	42,534	3,597,700	992	175,000	83,052	.....	.....	.....	.....	.....	.....	.....	.....	.....	1866
1867	50,838	3,347,300	791	190,000	119,917	.....	.....	.....	.....	.....	.....	.....	.....	.....	1867
1868	55,369	3,646,117	367	200,000	88,327	.....	.....	.....	.....	.....	.....	.....	.....	.....	1868
1869	58,533	4,215,000	144	220,000	202,308	.....	.....	.....	.....	.....	.....	.....	.....	.....	1869
1870	83,765	5,260,745	86	250,000	204,618	.....	.....	.....	.....	.....	.....	.....	.....	.....	1870
1871	90,030	5,205,234	273	269,397	165,129	.....	.....	.....	.....	.....	.....	.....	.....	.....	1871
1872	91,251	6,293,194	331	308,100	184,391	.....	.....	.....	.....	.....	.....	.....	.....	.....	1872
1873	104,036	9,893,786	467	365,052	474,379	.....	.....	.....	.....	.....	.....	.....	.....	.....	1873
1874	103,177	10,926,945	604	168,807	583,751	[A]149,837	.....	.....	.....	.....	.....	.....	.....	.....	1874
1875	108,569	8,787,514	813	220,000	697,364	158,522	[A]4,566	.....	.....	.....	.....	.....	.....	.....	1875
1876	111,314	9,132,669	2,891	312,000	1,320,523	164,157	7,708	.....	.....	.....	.....	.....	.....	.....	1876
1877	108,569	13,350,363	2,934	312,000	1,800,720	169,792	9,560	.....	.....	.....	.....	.....	.....	.....	1877
1878	109,300	15,396,868	4,329	312,000	2,400,960	175,420	17,884	.....	.....	.....	.....	.....	.....	.....	1878
1879	110,007	19,914,146	2,891	575,000	2,761,104	214,800	23,457	.....	.....	.....	.....	.....	.....	.....	1879
1880	114,321	26,286,123	2,035	350,000	3,001,200	229,120	25,497	[A]9,310	.....	.....	.....	.....	.....	.....	1880
1881	121,511	27,661,238	1,237	275,000	3,601,441	286,400	16,751	29,219	.....	.....	.....	.....	.....	.....	1881
1882	136,610	30,349,897	1,316	275,000	4,537,815	330,076	15,549	58,025	.....	.....	.....	.....	.....	.....	1882
1883	139,486	23,449,633	1,618	250,000	6,002,401	365,160	20,473	26,708	.....	.....	.....	.....	.....	.....	1883
1884	210,667	24,218,438	2,855	250,000	10,804,577	408,120	27,923	46,161	.....	.....	.....	.....	.....	.....	1884
1885	193,411	21,858,785	1,941	250,000	13,924,596	465,400	29,237	41,360	.....	.....	.....	.....	.....	.....	1885
1886	168,806	28,064,841	1,575	584,061	18,006,407	305,884	37,916	73,864	.....	.....	.....	.....	.....	.....	1886
1887	181,907	28,283,483	1,496	525,655	18,367,781	343,832	28,645	74,284	.....	.....	.....	.....	.....	.....	1887
1888	218,576	27,612,025	1,251	695,203	23,048,787	466,537	37,436	84,782	.....	.....	.....	.....	.....	.....	1888
1889	297,566	35,163,513	1,273	704,690	24,609,407	515,268	52,811	68,217	[A]94,250	.....	.....	.....	.....	.....	1889
1890	383,227	45,823,572	2,998	795,030	28,691,218	659,012	51,420	108,296	118,065	.....	.....	.....	.....	.....	1890
1891	488,201	54,292,655	8,305	755,298	34,573,181	630,730	52,917	108,929	190,131	.....	.....	.....	.....	.....	1891
1892	593,175	50,514,657	18,321	779,753	35,774,504	646,220	68,901	101,404	242,284	.....	.....	.....	.....	.....	1892
1893	535,655	48,431,066	19,069	798,406	40,456,519	692,669	106,384	99,390	298,969	[A]600,000	.....	.....	.....	.....	1893
1894	507,255	49,344,516	20,552	829,104	36,375,428	949,146	[B]173,000	122,564	327,218	688,170	.....	.....	.....	.....	1894
1895	575,200	52,892,276	25,843	726,138	46,140,174	1,452,999	170,000	121,277	371,536	1,215,757	.....	.....	.....	.....	1895
1896	543,348	60,960,361	18,149	726,822	47,220,633	2,443,080	237,000	145,061	429,979	1,427,132	[A]47,536	.....	.....	.....	1896
1897	570,886	60,475,516	13,892	709,857	54,399,568	2,226,368	262,000	165,745	545,704	2,551,649	70,831	.....	.....	.....	1897
1898	776,238	55,364,233	14,439	758,391	61,609,357	2,376,108	319,000	183,427	542,110	2,964,035	70,905	.....	.....	.....	1898
1899	1,425,777	57,070,850	16,121	808,570	65,954,968	2,313,047	539,000	192,232	940,971	1,795,961	89,166	.....	.....	.....	1899
1900	1,628,535	63,620,529	12,102	913,498	75,779,417	2,346,505	871,000	358,297	1,078,264	2,253,355	274,800	.....	.....	.....	1900
1901	1,678,320	69,389,194	16,150	756,679	85,168,556	3,251,544	1,117,000	313,630	1,430,716	4,013,710	274,800	[A]10,345	.....	.....	1901
1902	2,059,935	88,766,916	18,933	530,624	80,540,044	4,142,159	996,000	353,674	1,617,363	2,430,465	286,725	40,200	.....	.....	1902
1903	2,763,117	100,461,337	17,876	486,637	75,591,256	5,234,475	1,209,000	445,818	2,510,259	5,770,056	278,092	75,375	.....	.....	1903
1904	3,599,026	117,080,960	25,476	552,575	78,536,655	5,947,383	1,219,000	637,431	3,385,468	6,508,485	[B]290,000	125,625	.....	.....	1904
1905	4,420,987	134,717,580	44,027	634,095	54,960,270	5,765,317	1,347,000	560,963	4,137,098	7,849,896	373,000	251,250	.....	.....	1905
1906	6,378,184	126,493,936	53,577	569,753	58,897,311	5,467,967	1,564,000	578,610	4,015,803	8,180,657	531,000	502,500	.....	.....	1906
1907	8,118,207	166,095,335	59,875	788,872	61,850,734	8,455,841	1,718,000	756,631	4,344,162	9,982,597	751,000	1,005,000	[A]101	.....	1907
1908	8,252,157	178,527,355	50,966	527,987	62,186,447	12,612,295	1,871,000	1,009,278	5,047,038	10,283,357	945,000	3,932,900	11,472	[A]169	1908
1909	9,327,278	183,170,874	42,388	420,755	65,970,350	14,932,799	1,887,000	1,018,837	6,676,517	11,041,852	1,411,000	2,713,500	18,431	57,143	1909
1910	9,723,806	209,557,248	50,830	315,895	70,336,574	12,673,688	1,829,000	1,032,522	6,137,990	11,030,620	1,258,000	3,634,080	20,753	142,857	1910
1911	11,107,450	220,449,391	74,709	291,096	66,183,691	10,519,270	1,737,000	1,017,045	6,451,203	12,172,949	1,465,000	12,552,798	13,119	285,307	1911
1912	12,976,232	222,935,044	53,778	243,336	68,019,208	8,535,174	1,659,000	1,031,050	7,116,672	10,845,624	1,752,000	16,558,215	47,007	436,805	1912
1913	13,554,768	248,446,230	47,198	228,080	62,834,356	7,818,130	1,940,000	[B]857,000	7,930,149	11,172,294	2,071,000	25,696,291	130,618	503,616	1913
1914	12,826,579	265,762,535	39,849	214,805	67,020,522	[B]6,436,000	2,636,000	781,000	7,409,792	[B]11,422,000	1,837,000	26,235,403	275,500	643,533	1914
1915	12,029,913	281,104,104	43,898	215,464	68,548,062	5,352,000	2,928,000	703,000	8,202,674	11,920,000	2,579,000	32,910,508	[B]513,000	750,000	1915
1916	8,945,029	300,767,158	50,585	198,123	[B]65,817,000	6,587,000	2,963,000	656,000	8,491,137	12,547,000	2,593,000	39,817,402	867,000	928,581	1916
1917	3,720,760	335,315,601	40,763	213,832	63,072,000	6,228,000	2,861,000	642,000	8,078,843	13,180,000	2,577,000	55,292,770	1,218,000	1,602,312	1917
1918	[B]8,730,000	355,927,716	[B]35,000	304,741	27,168,000	6,032,000	2,441,000	270,000	[B]8,188,000	12,778,000	2,527,000	[B]63,828,000	1,353,000	2,082,068	1918
1919	6,618,000	[B]378,367,000	35,000	[D]241,000	31,752,000	6,096,000	2,238,000	265,000	8,736,000	15,508,000	2,628,000	87,073,000	1,331,000	[B]1,841,000	1919
1920	7,435,000	442,929,000	35,000	196,000	25,430,000	5,607,000	2,221,000	246,000	8,375,000	17,529,000	2,817,000	157,069,000	1,651,000	2,083,000	1920
1921	8,368,000	472,183,000	32,000	188,000	28,968,000	5,167,000	2,233,000	274,000	8,734,000	16,958,000	3,699,000	193,398,000	2,036,000	2,354,000	1921
1922	9,843,000	557,531,000	31,000	179,000	35,692,000	5,227,000	2,055,000	319,000	8,529,000	17,066,000	5,314,000	182,278,000	2,866,000	2,445,000	1922
1923	10,867,000	732,407,000	34,000	170,000	39,147,000	5,402,000	1,804,000	346,000	8,406,000	19,870,000	5,699,000	149,585,000	3,400,000	3,051,000	1923
1924	13,369,000	713,940,000	39,000	161,000	45,355,000	5,657,000	1,814,000	406,000	8,416,000	20,473,000	8,379,000	139,678,000	4,639,000	4,057,000	1924
1925	16,650,000	763,743,000	61,000	332,000	52,448,000	5,960,000	1,915,000	541,000	8,274,000	21,422,000	9,232,000	115,515,000	6,336,000	4,387,000	1925
1926	23,314,000	770,874,000	41,000	364,000	64,311,000	5,844,000	1,785,000	653,000	8,011,000	21,243,000	10,762,000	90,421,000	7,851,000	4,971,000	1926
1927	26,368,000	901,129,000	47,000	477,000	77,018,000	5,342,000	1,789,000	663,000	8,032,000	27,459,000	10,127,000	64,121,000	8,630,000	5,380,000	1927
1928	30,773,000	901,474,000	46,000	624,000	[B]84,745,000	5,492,000	1,944,000	630,000	8,741,000	32,118,000	12,006,000	50,151,000	9,070,000	7,684,000	1928
1929	34,758,000	1,007,323,000	45,000	1,117,000	[B]99,507,000	4,988,000	2,023,000	704,000	8,747,000	39,279,000	13,422,000	44,688,000	9,391,000	8,716,000	1929
1930	42,759,000	898,011,000	59,000	1,522,000	[B]125,555,000	4,904,000	2,047,000	1,222,000	8,887,000	41,729,000	12,449,000	39,530,000	9,002,000	9,419,000	1930
1931	49,741,000	851,081,000	124,000	1,543,000	162,842,000	4,662,000	1,966,000	1,608,000	8,715,000	35,539,000	10,089,000	33,039,000	11,709,000	9,744,000	1931
1932	53,815,000	785,159,000	208,000	1,044,000	154,367,000	4,116,000	1,630,000	1,608,000	8,817,000	39,001,000	9,899,000	32,805,000	13,139,000	10,126,000	1932
1933	54,020,000	905,556,000	204,000	1,145,000	154,840,000	4,072,000	1,455,000	1,665,000	8,743,000	42,606,000	13,257,000	34,001,000	13,691,000	9,561,000	1933
1934	62,063,000	908,065,000	151,000	1,417,000	174,318,000	3,913,000	1,834,000	2,187,000	10,503,000	46,925,000	16,314,000	38,172,000	14,024,000	10,894,000	1934
1935[1]	61,371,000	996,596,000	112,000	1,447,000	182,386,000	3,812,000	2,259,000	2,967,000	9,218,000	42,319,000	17,067,000	40,241,000	14,295,000	11,671,000	[1]1935
1936[1]	63,750,000	1,099,687,000	116,000	1,508,000	189,941,000	3,777,000	2,445,000	3,087,000	9,619,000	44,203,000	17,595,000	41,028,000	15,455,000	13,237,000	[1]1936
1937[1]	53,100,000	1,277,364,000	150,000	2,670,000	196,141,000	3,485,000	2,689,000	3,143,000	9,810,000	50,000,000	17,455,000	46,000,000	16,300,000	15,500,000	[1]1937
Total	780,390,176	19,972,090,719	2,542,718	40,770,770	3,771,601,907	250,998,251	75,265,035	37,417,041	273,663,365	777,872,621	222,562,855	1,863,975,162	169,284,001	144,553,391	Total

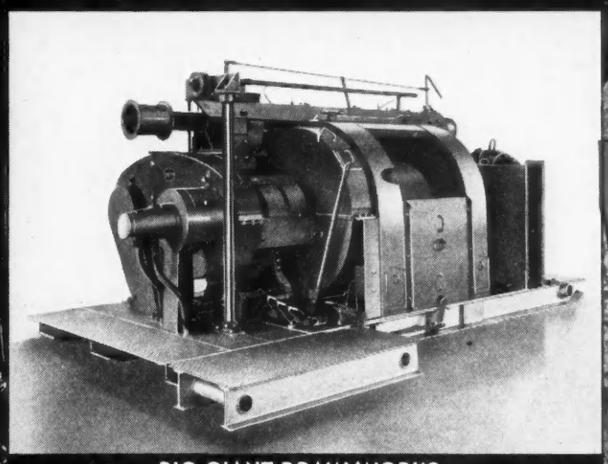
[A] Actual numbers of barrels are shown prior to 1918, as reported in *Mineral Resources*, 1918; except in cases where revisions have been made in later reports, with such revisions being in thousands of barrels.

[B] Figures beginning with this year are shown in nearest thousand barrels, being from *Mineral Resources* of 1930, and 1931; and from *Minerals Yearbook* in subsequent years.

[C] Production of France in previous years credited to Germany.

[D] No more data available.

IDECO



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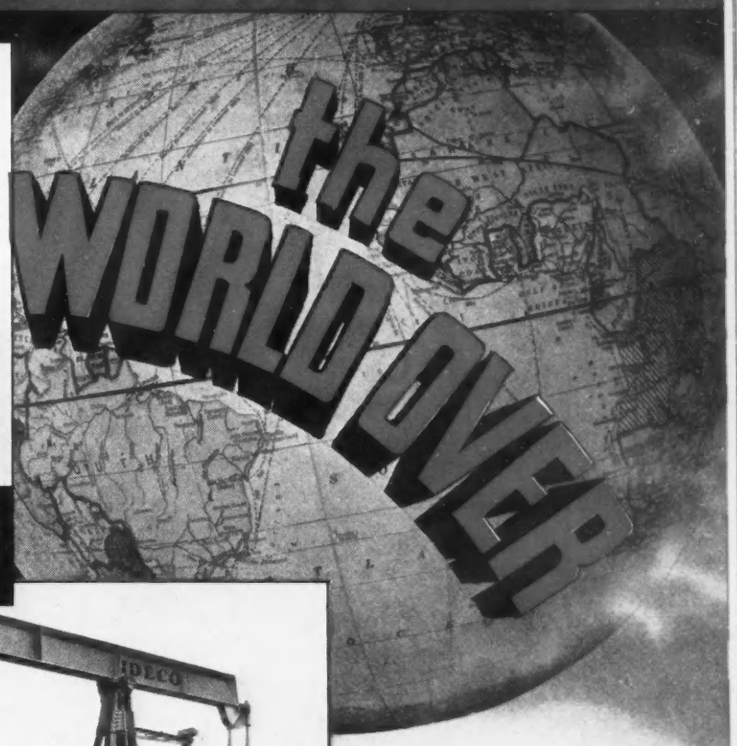

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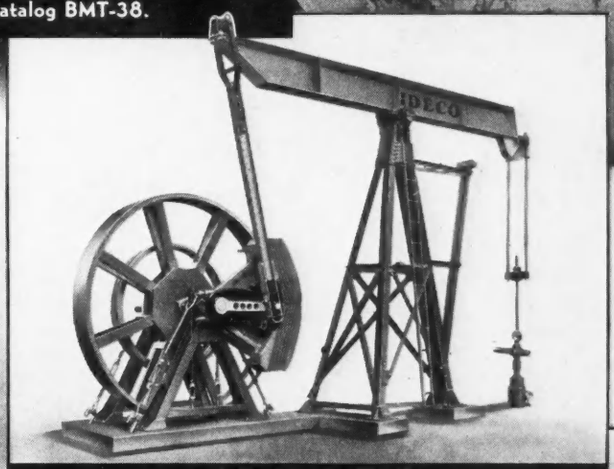

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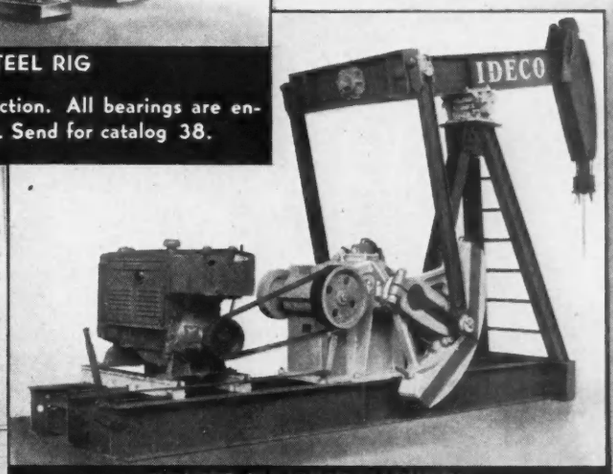

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lands India, which ranked through 1937 as the seventh most productive country, with 2.49 percent of the all-time world output.

The above mentioned seven countries have accounted for approximately 95 percent of all the oil production of the world, through 1937.

Other changes in the rank of countries in all-time production in 1937 included moves upward by Iraq and Bahrein Island. Iraq moved ahead of both Japan and British Borneo, into fourteenth place, as its cumulative production rose slightly above 100,000,000 barrels. Bahrein Island, by producing about 8,600,000 barrels in 1937, moved ahead of France in all-time output.

World Crude Oil Production, by Countries, by Years—(Continued)

Complete Production History of World, in Barrels of 42 U. S. Gallons

(Sources.—*Mineral Resources* of the United States, 1918, 1930 and 1931; *Minerals Yearbook*, 1932, 1933 and subsequent years. Note: The figures of *Mineral Resources*, 1918, have been replaced here by figures from later reports, in cases where revisions have been made.)

YEAR	Egypt	Iran (Persia)	British Borneo (Sarawak And Brunei)	Algeria	Ecuador	Venezuela	France	England	Czecho-slovakia	Sakhalin	Colombia	Iraq	Bolivia	Bahrein Island	Other Countries	Total World	Percent Produced by U.S.	YEAR
1857																1,977		1857
1858																3,560		1858
1859																6,349	31	1859
1860																508,578	98	1860
1861																2,130,917	99	1861
1862																3,991,692	99	1862
1863																2,762,940	94	1863
1864																2,303,780	92	1864
1865																2,715,524	92	1865
1866																3,799,278	92	1866
1867																3,708,846	90	1867
1868																3,990,180	91	1868
1869																4,695,985	90	1869
1870																5,799,214	91	1870
1871																5,730,063	91	1871
1872																6,877,267	92	1872
1873																10,837,720	91	1873
1874																11,933,121	92	1874
1875																9,977,348	88	1875
1876																11,051,267	83	1876
1877																15,753,938	85	1877
1878																18,416,761	84	1878
1879																23,601,405	84	1879
1880																30,017,606	88	1880
1881																31,992,797	86	1881
1882																35,704,288	85	1882
1883																30,255,479	78	1883
1884																35,968,741	67	1884
1885																36,764,730	59	1885
1886																47,243,154	59	1886
1887																47,807,083	59	1887
1888																52,164,597	53	1888
1889																61,507,095	57	1889
1890																76,632,838	60	1890
1891																91,100,347	60	1891
1892																88,739,219	57	1892
1893																92,038,127	53	1893
1894																89,336,953	55	1894
1895																103,691,200	51	1895
1896																114,199,101	53	1896
1897																121,992,016	50	1897
1898																124,978,293	44	1898
1899																131,146,663	44	1899
1900																149,136,302	43	1900
1901															20,000	167,440,644	41	1901
1902															26,000	181,809,038	49	1902
1903															36,000	194,879,298	52	1903
1904															40,000	217,948,084	54	1904
1905															30,000	215,091,483	63	1905
1906															30,000	213,263,298	59	1906
1907															30,000	263,956,355	63	1907
1908															30,000	285,287,421	63	1908
1909															20,000	298,708,724	61	1909
1910															20,000	327,763,863	64	1910
1911	[B]21,000														20,000	344,361,028	64	1911
1912	214,000														20,000	352,443,145	63	1912
1913	98,000	[B]1,857,000	[B]141,000												20,000	385,345,730	64	1913
1914	753,000	2,910,000	318,000	[B]1,000											20,000	407,542,518	65	1914
1915	212,000	3,616,000	392,000	4,000											10,000	432,033,623	65	1915
1916	404,000	4,477,000	629,000	8,000											25,000	456,771,015	66	1916
1917	943,000	7,147,000	542,000	9,000	[B]57,000	[B]120,000	C								29,000	502,889,881	67	1917
1918	1,335,000	8,623,000	504,000	7,000	[E]60,000	333,000	[B]363,000								25,000	503,514,525	71	1918
1919	1,517,000	10,139,000	596,000	5,000	[E]60,000	425,000	334,000	[B]2,000	[B]48,000						20,000	555,875,000	68	1919
1920	1,042,000	12,230,000	1,020,000	4,000	[E]60,000	457,000	356,000	3,000	69,000						20,000	688,884,000	64	1920
1921	1,255,000	16,673,000	1,411,000	3,000	[E]60,000	1,433,000	389,000	3,000	94,000	[B]2,000	[B]67,000				20,000	766,002,000	62	1921
1922	1,188,000	22,247,000	2,849,000	9,000	[E]60,000	2,201,000	496,000	1,000	120,000	7,000	323,000				22,000	858,898,006	65	1922
1923	1,054,000	25,230,000	3,940,000	9,000	87,000	4,201,000	494,000	1,000	74,000	9,000	425,000				24,000	1,015,736,000	72	1923
1924	1,122,000	32,373,000	4,163,000	11,000	[E]100,000	9,042,000	497,000	2,000	76,000	80,000	445,000				24,000	1,014,318,000	70	1924
1925	1,226,000	35,038,000	4,257,000	12,000	160,000	19,687,000	459,000	3,000	158,000	87,000	1,007,000				23,000	1,068,933,000	71	1925
1926	1,188,000	35,842,000	4,942,000	9,000	214,000	36,911,000	478,000	2,000	150,000	181,000	6,444,000				17,000	1,096,823,000	70	1926
1927	1,267,000	39,688,000	4,943,000	8,000	537,000	63,134,000	504,000	2,000	112,000	440,000	15,014,000	[B]338,000			13,000	1,262,582,000	71	1927
1928	1,842,000	42,461,000	[G]5,223,000	8,000	1,084,000	105,749,000	512,000	1,000	94,000	677,000	19,897,000	713,000			15,000	1,324,774,000	68	1928
1929	1,868,000	42,145,000	5,290,000	20,000	1,381,000	137,472,000	535,000	D	93,000	[E]1,134,000	20,385,000	798,000	H		38,000	1,485,867,000	68	1929
1930	1,996,000	45,833,000	4,907,000	16,000	1,553,000	136,669,000	523,000	H	157,000	[E]1,805,000	20,346,000	909,000	[B]56,000		40,000	1,411,905,000	64	1930
1931	2,038,000	44,376,000	3,854,000	D	1,762,000	116,613,000	527,000	D	134,000	2,734,000	18,237,000	900,000	25,000		54,000	1,373,656,000	62	1931
1932	1,895,000	49,471,000	3,796,000	D	1,597,000	116,541,000	530,000	D	126,000	2,631,000	16,414,000	836,000	44,000		62,000	1,309,677,000	60	1932
1933	1,663,000	54,392,000	4,490,000	D	1,620,000	117,720,000	562,000	D	122,000	2,338,000	13,158,000	917,000	112,000	31,000	71,000	1,442,112,000	63	1933
1934	1,546,000	57,851,000	5,140,000	D	1,637,000	136,103,000	557,000	D	178,000	2,881,000	17,341,000	7,689,000	159,000	285,000	96,000	1,522,243,000	59.7	1934
1935[I]	1,295,000	57,304,000	5,389,000	2,000	1,732,000	148,529,000	539,000	D	140,000	2,545,000	17,598,000	27,311,000	163,000	1,265,000	594,000	1,650,158,000	60.4	[I]1935
1936[I]	1,223,000	61,728,000	4,720,000	2,000	1,951,000	155,229,000	535,000	D	131,000	2,218,000	18,756,000	29,406,000	160,000	4,645,000	552,000	1,786,704,000	61.5	[I]1936
1937[I]	1,163,000	73,383,000	4,500,000	2,000	2,168,000	182,751,000	544,000	D	121,000	2,380,000	20,006,000	31,171,000	D	8,600,000	575,000	2,021,171,000	63.2	[I]1937
Total	31,968,000	788,034,000	77,956,000	149,000	17,940,000	1,491,320,000	9,734,000	20,000	2,197,000	22,149,000	205,863,000	100,988,000	719,000	14,826,000	2,731,000	31,149,582,012	64.1	Total

[B] Year ended September 30.
[E] Estimated.
[G] Beginning of production from Brunei.
[H] Less than one thousand barrels.

[I] For 1935, 1936 and 1937, figures for countries outside the United States are preliminary, having been estimated by THE OIL WEEKLY, with aid of government and other sources.

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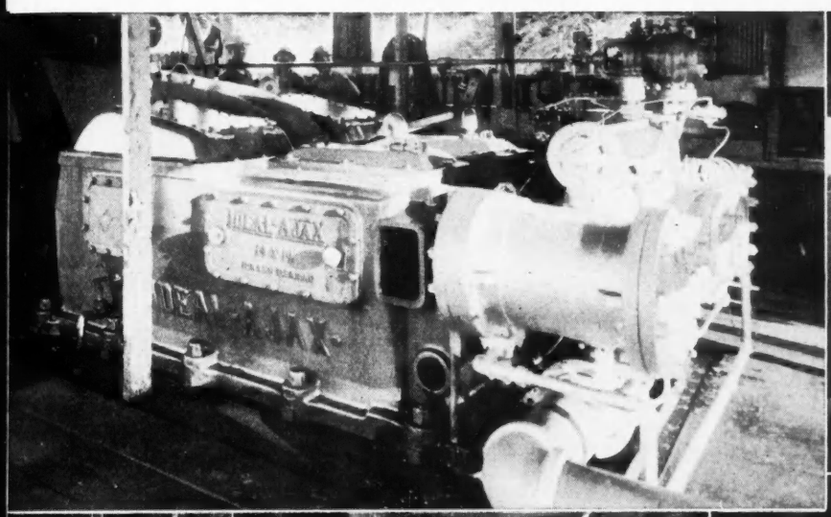

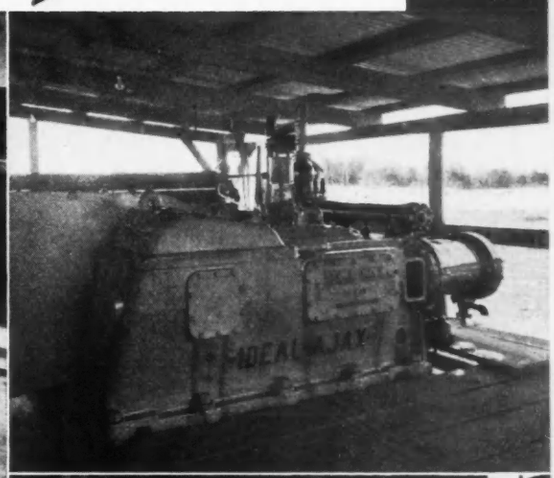

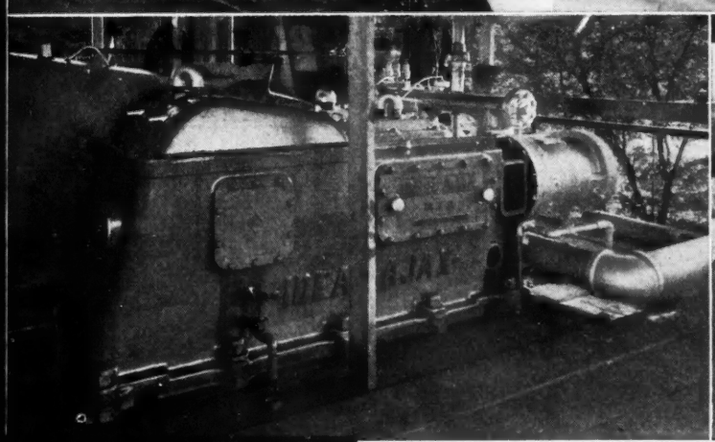

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Trinidad

The year 1937 was a record on all counts and plans for development include further advances during 1938; deep drilling in old fields offsets natural decline of producers.

AS PREDICTED in the semi-annual review of Trinidad oil field operations published in THE OIL WEEKLY last year, 1937 ended with a summary of operating results which outshines by far that of all previous years for the three index factors of footage drilled, new production gained and total amount of oil produced.

In the review referred to above, it was forecast that 1937 production would reach 15,500,000 barrels; figures now available have proved this correct, the actual total attained being 15,502,785 barrels. Thus, the comparative picture of oil production and corresponding footage drilled over the past four years can now be given in authentic figures as follows.

	Production	Footage Drilled
1934	10,894,363	351,783
1935	11,671,224	436,299
1936	13,237,000	594,534
1937	15,502,785	911,053

A total of 251 wells were completed during the year (114 in the first half and 137 in the second half after the strike period) occupying in all a total of 40 strings of tools over the island, of which number about 5 were engaged on wholly "wild-cat" wells.

Further to these outstanding achievements, elaborate plans for both field and refinery operations have already outlined 1938 as another year of rapid activity in all branches of the industry and set a pointer on development programs which, once commenced, will require several years of intensive activity to see them fulfilled.

It will be noticed that the total production for the island has been increased by some 50 percent over the last 3 years, i.e., from 10,000,000 barrels for 1934 to 15,000,000 barrels for 1937.

Moreover, it can also be said that Trinidad has more or less attained to a settled yearly production rate of at least 15,000,000 barrels which would not only have its normal decline offset by the number of exploitation strings drilling, but which moreover may be substantially and permanently increased during 1938 by results from a number of exploration strings drilling in promising territory.

Deep Drilling Offsets Decline

The Fyzabad structure, on which Trinidad Leaseholds, Limited and Apex (Trinidad) Oilfields are the two largest producers, continues to supply some 60 percent of the total crude production obtained on the island, and one-time rumors of a gradually declining production from this area have been wholly repudiated by the achievements of last year. Sands deeper than the 3500-4000 series which was the main exploitation objective of the past have been explored and new production from these deeper horizons is expected to do much more than offset the normal decline of old production from the shallower sands. In addition, some considerable amount of new territory must be added to the proven acreage here by the reported completion during 1937 of a new producer in the western extension of the Forest Reserve field. The Fyzabad structure should thus, to all appearances, continue for several years yet to be the main supply source of the bulk of the island's crude oil production.

As it were, Trinidad can be said to be divided into two main geological provinces by a great fault running east to west from near Matura to Port-of-Spain as indicated roughly on the accompanying map. This fault separates the Tertiary sediments to the south from the Metamorphic area of the northern range. The island can again be divided into three parts (as per sketch) i.e. (a) The Northern Metamorphic Area, and (b) the Southern section which is the area of proven oil-bearing lands on which the present commercial oil fields of Trinidad are situated, leaving the Central section as speculative undeveloped territory. It is in this Central one third section that we find the "Northern Basin" (between the Northern and the Central Range) which at the moment is the most prominent feature in the big program of exploration work which is scheduled for the future.

During 1937, Trinidad Northern Areas Limited, the Joint Interest organization of Trinidad Leaseholds, Limited and United British Oilfields of Trinidad, Limited, pur-

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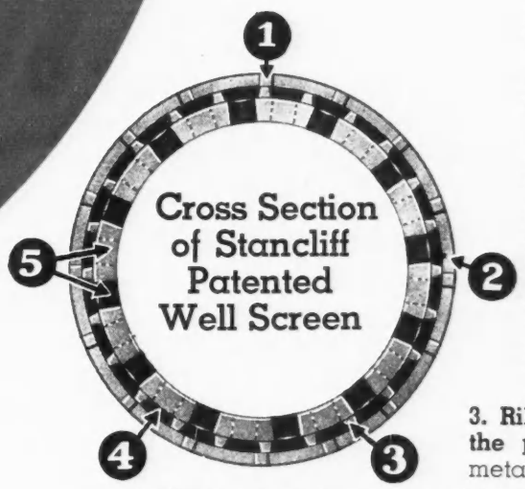

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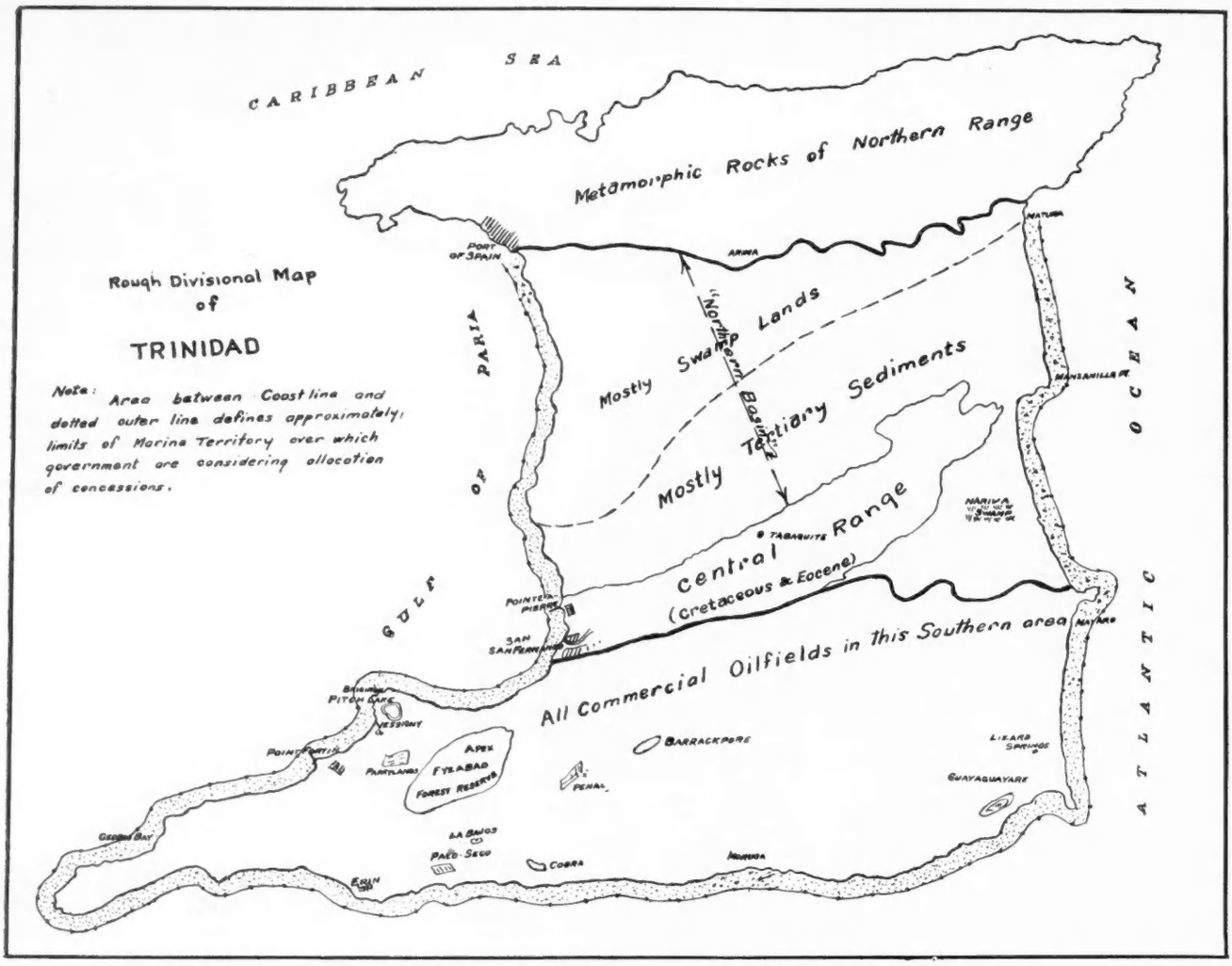

sued an extensive program of geophysical and geological work over this territory and indications are that this work will proceed until almost the entire Northern Basin has been so examined. It is understood that two seismograph outfits are actively engaged in this area. Information as to results obtained are of course closely guarded secrets, but judging from the fact that Trinidad Northern Areas and one or two other companies are engaged in what might be termed an aggressive leasing campaign in this area, it is reasonable to assume that some good reflections must have been recorded by the seismograph over the large portion of territory already examined.

Previous to the entry of Trinidad Northern Areas into this locality, the territory was considered only as highly speculative from the point of view of oil accumulation. The results of an actual test with the drill here is of course eagerly anticipated on all sides. It is not yet definitely known what time drilling will be commenced, but this can be assumed as being in the near future as some of the land leases taken in a campaign of the kind are certain to contain early drilling obligations.

Marine Drilling

The allocation of concessions over the 390,000 acres of submarine land in territorial waters which have been applied for by the various companies has not yet been made by the government. It is likely, however, that this will be done in the present year as the Government Survey Department is occupied in staking shore markings in this connection. This survey gives point to the belief that the final allocation of these concessions will be influenced in great measure by the ownership of the oil concerns which control operations on the corresponding shore line. Considering, however, the large amount of inland territory remaining to be explored, it is feasible to assume that almost all the development work during 1938 will continue to be concentrated in the interior. The marine area over which licences have been applied for is shown on the accompanying map between the coast line and the outer dotted line extending roughly from Port-of-Spain around the southern part of the island to approximately about Matura in the east.

Apart also from the actual amount of additional land over which operations are scheduled to commence at some time in the future, considerable additional prospects center around the potentialities of the deeper-lying horizons under fields which have so far exploited only the shallower strata. In this connection, it is significant to note that during 1937 about a dozen wells were completed to depths of 6000 feet and more—an almost unheard of local achievement not less than 3 years ago.

Deeper Drilling

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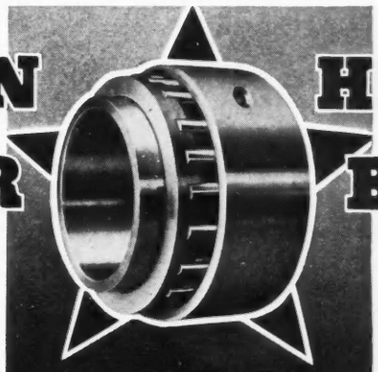

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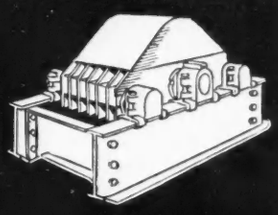

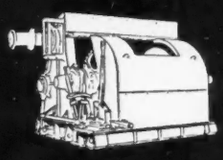

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A wildcat operation in Trinidad

consequent improvement in drilling speeds, depths of 6000 feet and over are today to be considered almost a commonplace in Trinidad.

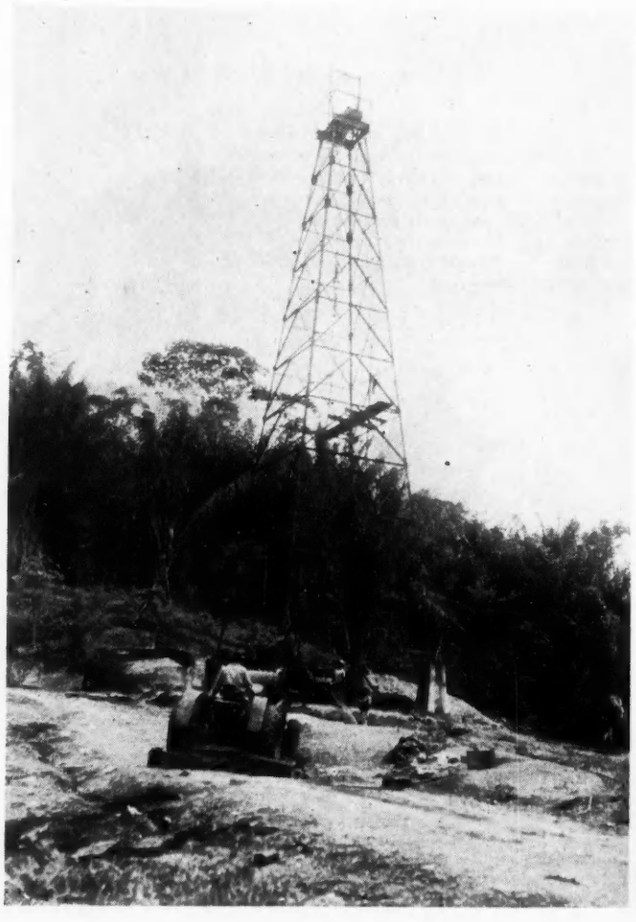
Additional attempts have been made at winning commercial production from Cretaceous formation and although results in one test carried to around 6500 feet in the Palo Seco field have not been reported as encouraging, the drill is still being operated with this objective in view.

It is also to be recorded that during 1937 one company drilled into and is now producing from the Eocene formation in one or two wells.

It can now also be said that production from the Deep Cruse horizons has been definitely assessed as existing on a commercial basis and, if anything, 1938 will probably see Trinidad drilling depths approaching the limits of some of the deep holes of the United States.

In the matter of possible oil lands remaining for lease, there is only very little desirable acreage available anywhere in the island. The year 1937 has seen what was possibly the most frantic race for the acquisition of oil rights that has ever been witnessed in the history of the industry locally. Within the last two years almost all the local companies have been engaged in extending their holdings in proven and semi-proven territory and also taking up considerable acreage in undeveloped and sometimes almost unknown territory. Six new oil companies were registered in the island during the year, bringing the total number of registered companies in the island as at the end of 1937 up to 20. Even now it can be said that there is hardly any worthwhile land at all remaining available in the southern one third section of the island, the present locality of the commercial fields, and only a comparatively small amount in the central one third section which, it would appear, must be taken up quickly and possibly at competitive rentals.

No definite information has resulted from the wildcat wells operated during 1937 at Mayaro, Cedros, Point Ligoure and near Barrackpore, but the work scheduled for 1938 should either publicly dis-



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prove these areas or put them on the map as new worthwhile fields.

This phase of operations, coupled with news of actual drilling in the "Northern Basin" will mark 1938 as the forerunner of several years which will carry some of the most important exploratory work of recent years in Trinidad.

Refining

In the refining department mention cannot be omitted of the extensive expansion and modernization program of the Trinidad Leaseholds Refinery at Pointe-a-Pierre which is now fully under way. The cracking and reforming capacity of this plant is being extended and the major part of the construction program centers around two cracking installations of the Dubbs type. It is understood that this plant will turn out a large volume of aviation spirit for the British Air Ministry, and that, when completed, the former total capacity of the refinery will be up by over 100 percent.

Trinidad however is still dependent on world markets for the disposal of its petroleum and products as only between 10 to 15 percent of production is consumed within the country for all purposes.

General

The report of the Royal Commission which took a considerable amount of evidence in Trinidad shortly after the labor disturbances of June last is not yet to hand, but it is understood that this should be available within the next month or two.

As a result of the above mentioned disturbances, the oil industry along with other local industries generally, has moved on to a belated but commendable policy of trade unionism, and workers are now combined into an appreciable size organization, the president of which has very lately been elected to a seat on the legislative council of the colony.

Labor conditions on the oil fields generally are on the improve, and the program of new housing and recreational facilities proposed for completion during 1938 should bring into circulation locally an amount reaching into several thousands of dollars.

New type of oil field bungalow built for the climate in Trinidad

Cuba

Production of naphtha is taken to indicate possibilities of important oil deposits but nature of country and its agricultural people retards the necessary investigation

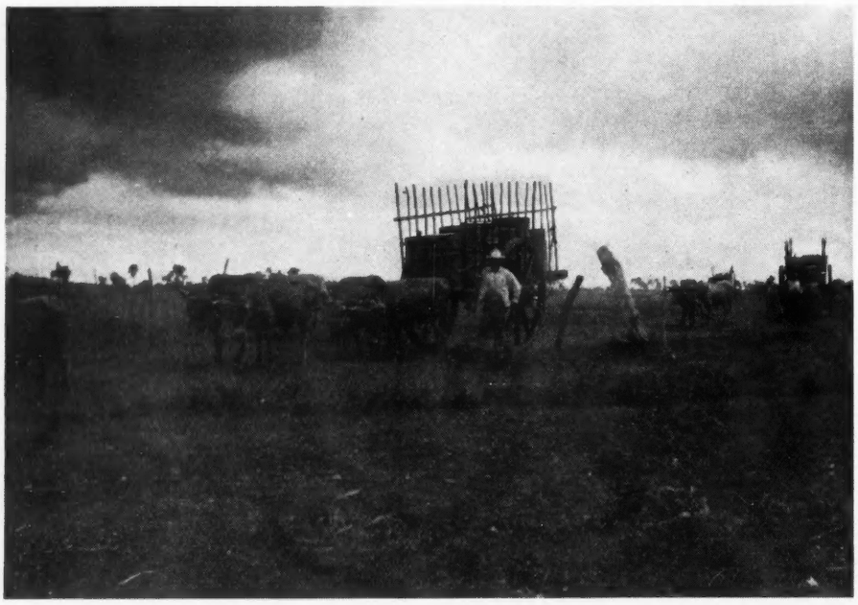
THERE has been considerable explorative work done in Cuba, and the greater part of the island is already under mineral lease to several major companies.

Here is found a phenomena—"pure high-test gasoline", which is produced in commercial quantity directly from the ground without need of refining or distillation. The presence of this naphtha has been known for 50 years or more, and a field of recognizable proportion has been developed in Santa Clara Province in an isolated district called Motembo (it is said to be the old Indian name meaning "land of fire") which lays about 160 miles from Havana, the last 20 of which are a most laborious and difficult journey.

This Motembo field has had wells drilling and development work of a sort going on for perhaps 20 or more years. During the past 5 years the work has become decidedly more serious in its purpose, as well as efficient in its management. However the methods used are still with few exceptions quite ancient and in keeping with the rural activity of the section of the country.

The product is still transported the 20 miles more or less from Motembo to the central highway and the main railroad which parallel each other almost the entire length of the island and really form the backbone of Cuba, in a most primitive fashion. First it leaves Motembo in 52-gallon drums loaded on oxcarts and is hauled for about 4 miles, often through mud 3 or 4 feet deep, to an ancient line of sugar rails built many years ago by a sugar mill. There it is loaded aboard home-made flat cars drawn by likewise home-made contraptions called "guaguas," old automobile engines equipped with large gears and put on rail wheels, which negotiate the somewhat perilous trip of 7 miles over the rickety rails to a switch where the drums are transferred to a train of the original "jerk-water" variety which takes it another 4 miles to Los Arabos which is a pueblo in Matanzas Province on the main railroad line as well as on the central highway. There have been several improvements used by some of the Motembo operators this past year in this means of marketing their product. One group sell their naphtha to a major company (Sinclair Cuba Oil Corporation), distribu-

Bailing naphtha from a Montembo well. well. The product is motor fuel and clean enough for cleaning fluid.



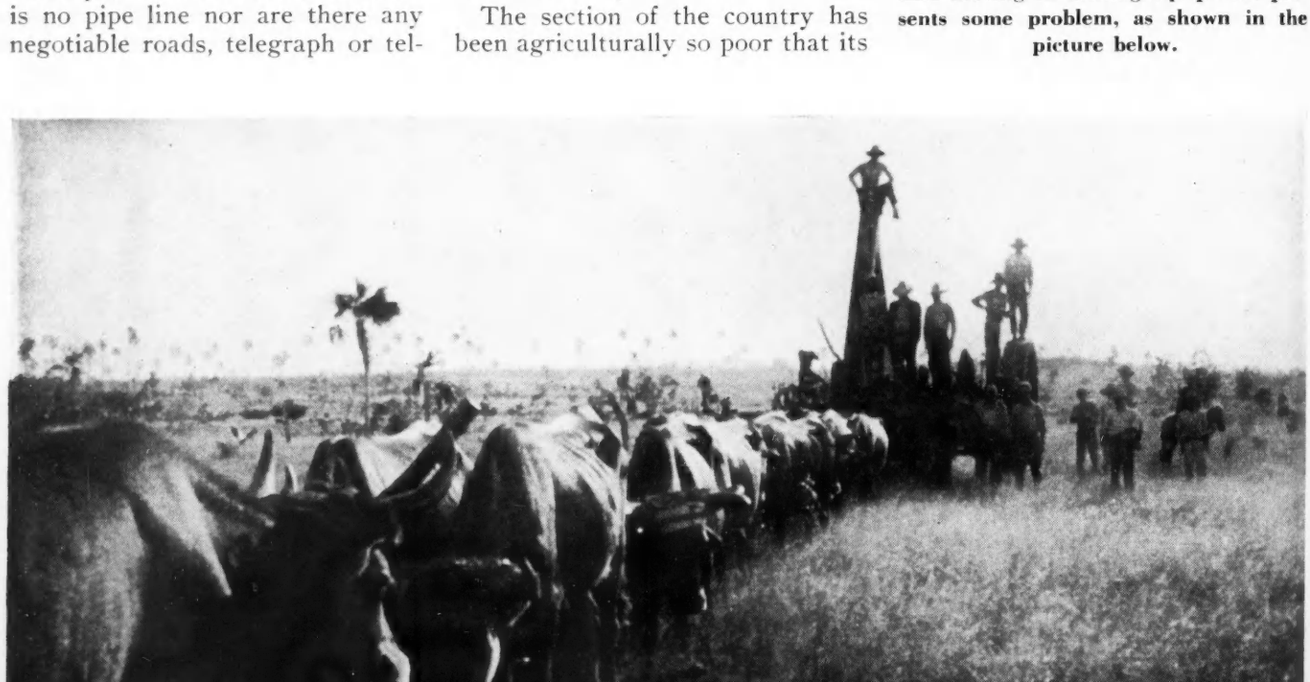
Transportation of the output of Cuba's naphtha wells involves the ox even after a railroad is reached. The drums shown in the cart are loaded into a railroad car and moved another leg of the journey as shown.

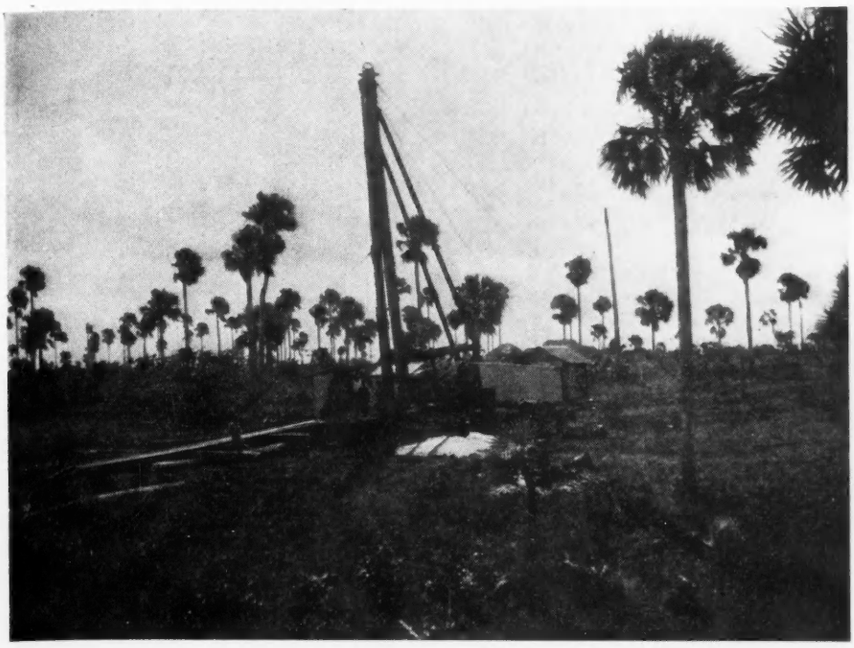
Also moving in drilling equipment presents some problem, as shown in the picture below.

tors in Cuba of gasoline, lubricants and paints, who send in a tank car about once or twice a week to a rail siding beyond the switch where the drums are brought out first by oxcart and then by "guagua" to that point and then siphoned into the tank car. Also a full sized box car is sent in spasmodically as far as the sugar railroad rails go and receives the naphtha drums for loading there directly from the oxcarts. But there is no pipe line nor are there any negotiable roads, telegraph or telephone or modern means of conveyance or communication.

There are less than a dozen operators in this Motembo field. A few of them have been genuinely successful, it being said that one group in particular has grossed close to $2,000,000 in about 5 years. But to date the financial success of the field has not been commensurate with the promise the marvelous natural product warrants. This is due to many causes.

The section of the country has been agriculturally so poor that its



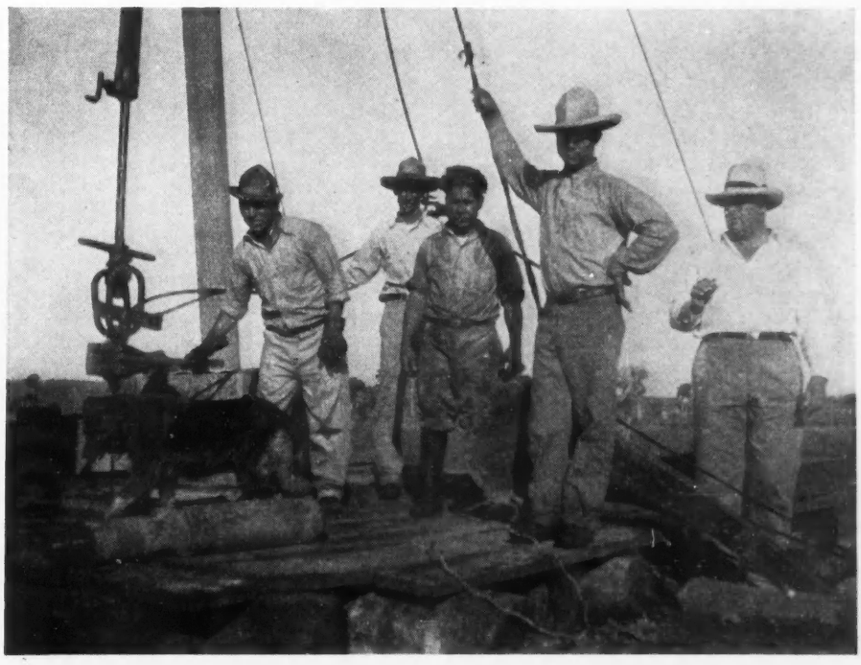


Degener Petroleum Company's No. 3 well will be drilled with this spudder.

people are still very primitive in their modes of living, moving and thinking. All of which the operators in the field have to contend with. As Cuba itself has been sugar-minded—little or no money has been spent where its lands are not valuable for sugar cane development and the Motembo surface area is decidedly rocky and of little or no surface value, so that for this reason, while it lies just a short distance from Cuba's national highway, it has no direct negotiable road to it. On the other hand the field has not been developed sufficiently to warrant the operators trying to build such a road themselves, for it must also be remembered that Cuba has far different laws in respect to surface rights and rights-of-ways than those existing in the United States. While many of its newer laws are being fashioned after United States laws, many of the existing laws are still fashioned after the old Spanish laws where properties which came under the old Spanish grants are concerned. A matter worth mentioning here, is that in almost all cases the surface rights owners do not own the mineral rights and therefore take little or no interest in problems affecting the mineral right owners or concessionaires and demand unreasonable compensation for trespass. It is not like in the United States where the farm owner owns below his land everything that it might produce or contain; nor are there the large communities in Cuba as in the United States, where community interest can prevail and flourish.

Two well known major companies (Shell Mex. and the Atlantic Refining Company interests), are said to have done much research work throughout the island. But the Motembo area itself, is believed to be too much cut up in small tracts and leaseholds with excessive royalty demands to arouse their interests; moreover it is strongly held by operating independents, who can operate successfully there with naphtha production which demands a price sufficiently large to enable them to pay their royalties; but for a major company to come in and pay an over-riding royalty to these present independent holders scarcely would be warrantable.

Just this past year Shell Mex. interests had a group of trained workers in Cuba for several months carrying on tests with core-drilling and various scientific equipment. The result of their labors is of course not available to the independent operators. Another possible cause for lack of rapid advancement in field development is the very fact that there is little if any definite recorded knowledge of past performance of other operators. Logs are kept to be sure, and have been kept, but they inspire little real confidence in their perusal when one realizes that the native drillers are characteristically temperamental and more than often inaccurate in their notations



A typical Cuban drilling crew. These are good boys and mean well (some are not). At right is Armin Degener of Degener Petroleum Company of Cuba.

Visiting oil men at Degener's camp coming in from a ride over the lease. Left to right, Clarence W. Luton, H. H. Phillips, Armin Degener and Charles B. McClintock.

and logs are too often purposely given out falsely to mislead the prospective operator.

The naphtha found in the Motembo district has so far always been found in a serpentine formation but scarcely ever under uniform conditions. Sometimes it appears at one level, and then in an adjacent well at a totally different depth, the depths varying from 600 to 1800 feet. Production is probably most often found around 1200 feet.

The wells are very nearly always pumpers, there have been two notably flowing wells however which came in, one an actual gusher in 1933 which went over the top of the derrick and flowed freely for a number of months, continuing a good production on the pump for several years and then dwindled down to an occasionally pumped well, it never having gone completely dry.

Then this past year another actual flowing well came in. The naphtha flowed freely from a four-inch valve for over a month, then dwindled down. Its flush production being about 120 barrels a day, this amount was reduced to about half within six to eight weeks. As naphtha brings a price of from 21 to 23 cents per gallon at the well, even a production of 1 or 2 barrels per day per well is of some interest to an operator. The nursing of the gas pressure in the pumping of the wells has much to do with the life of the well. There is not an overabundance of gas pressure in the Motembo drilled wells.

The wells rarely go completely dry but dwindle off to a barrel or so every other day and the operators lose interest in them. It shows however that after they have struck the storage pockets and pumped these empty, there is still feeding thereto in practically every well a steady seepage of naphtha from some large source somewhere or perhaps still being cracked and distilled from a boiling crude oil bed. A common way to get the production out of a small producer is to run the bailer and slush the pure naphtha up and dump it into an open barrel and letting the sediment, of which there is little or nothing, settle and then pour the clear crystal naphtha into a drum for immediate shipment and consumption. There has never been any reconditioning work on old wells, nor has there been any experimental work with acid treatment. This past year an attempt was made to try a vacuum on some wells in the Vesuvius tract which is about 4 miles southeast of the Motembo proper field, but little or no success was obtained. The method employed in itself was of experimental nature and might not have been properly employed.

One group of operators in Motembo are now "standardizing" all their machinery and are really establishing a very commendable and efficient field management, and their record for drilling is hard to surpass in any field. Out of 33 wells drilled they had only 3 non-producers and this out of about as many acres.

The source of petroleum from which the Motembo naphtha arises has not yet been located and it was commonly believed to be some great distance away or at a great depth beneath until the (Degener Petroleum Company of Cuba), Compania Petrolera Degener de Cuba's No. 2 well, which was located from a point to the east between the two known producing naphtha fields, namely the Motembo proper field and Vesuvius tract, and in it a heavy crude was en-

countered at 160 feet and then a much better and finer grade of crude was found at 1245 feet after a heavy flow of dry gas had been encountered. This well then for some mysterious reason ran into a fishing job in which its tools became jammed and were lost in the hole, the breaking of a brand new cable and the separating of the casing with much serious caving in upon the tools, resulting in the entire crew being dismissed.

The Degener people have not yet cleaned this well out but instead a third well was started closer toward the Motembo side of the property and further away from the limestone outcroppings which bordered to the east of the No. 2 well. Number 3 is on the same side of a range of hills on which good naphtha production has been found in Motembo and its progress will be watched with much interest as the well is being drilled by an entirely different crew and a spudder is being used. At last report it was reaching the 1100-foot level and is being drilled in the usual serpentine formation prevalent in the Motembo proper field and the Vesuvius area, with considerable caving and no gas of any kind as yet.

Although so far the most active field work in Cuba has concerned itself with naphtha, there is actual production of crude oil. It is found about 20 miles from Havana, near the pueblo of Bacuranao in the Province of Habana. It is said that some 50 odd wells have been drilled there, many of them producing from greatly varying depths anywhere from 600 to 2000 feet or more. The crude is not of uniform gravity nor does the same gravity appear at uniform depth. The methods of production there are far from modern and it would be interesting to know what a major company outfit could accomplish in the terrain that has already produced so much under unfavorable development conditions. The crude from this field originally was purchased by some of the major companies located here and importing fuel and lubricating oils for the large sugar mills. But a number of years ago when the price of crude here was around $5.00 per barrel and then suddenly dropped to $2.50 per barrel, the Cuban owners built their own refinery, having decided to use the crude rather than to sell it at the lower price and have conducted a small business on these lines since.

There has been considerable explorative work done by several major companies at the other end of the island, in Oriente Province, the terrain around Manzanillo, a seaport on the Caribbean, shows many surface indications for petroleum including actual free seeps where crude seepage can be gathered from the surface of streams and ponds. So far there has not been any actual drilling in this district and the knowledge obtained through the scientific work of the crews and geologists sent there by the major companies is not available to the public.

But the naphtha producers of the Motembo district in Santa Clara Province go courageously on, firm in the belief that they will develop a field that will some day be of major importance. Further development of the Degener properties will be watched with especial interest, inasmuch as they are so far the only ones to have had showings and actual crude oil in this known naphtha field. In the Turner Valley field in Canada some of the naphtha wells found there have eventually turned into crude wells, and it may be that Motembo has a similar development ahead. Meanwhile the market for the naphtha is steadily enlarging. A goodly number of gasoline stations in Havana are served twice weekly with tank trucks bringing this product in for use of Havana's motorists. There is also much demand for the naphtha as a thinner for paints as well as a cleaning fluid for dry cleaners.

Other independent operators are now actually drilling, one in the Province of Pinar del Rio near the pueblo of Artemisa. Another not far from Los Arabos in the savanah lands there quite a distance away from the Motembo hilly area. When last heard of both wells in the areas just mentioned were down about 1300 feet, both had a bit of gas but no other showings.

The photographs herein displayed have been loaned through the courtesy of the Compania Petrolera Degener de Cuba.

Part of the journey into the Degener's camp is made on this rail arrangement.

Czechoslovakia

Steadily dropping production spurs search for new sources of petroleum, but immediate prospects of such activity still unknown

THE principal oil fields in Czechoslovakia are those (1) in Western Slovakia, at Gbely, Hodonin and Vacenovice on the Morava River at the southern border of Moravia and Slovakia, (2) at Turzovka near the border of Silesia and Slovakia, and (3) along the northeastern border of Slovakia, at Mikova, Luha and Jasina.

The state is operating the wells at Gbley in western Slovakia, and the average annual output is about 12,000 tons. The wells here are from 150 to 260 meters deep, and the oil-bearing sandstone beds range from 2 to 14 meters thick. The oil is a heavy naphtha with a specific gravity of 0.9349; non-paraffinous, contains no gasoline or kerosene; lubricating oils are of low market quality; no high-grade lubricants are producible from the crude.

The state also owns the wells at Turzovka, but operations were suspended in 1932.

The "Apollo" Mineralolraffinerie A. G. of Bratislava has been carrying on explorations at Hodonin in Moravia, and have averaged about 12,000 meters of boring a year with wells up to 900 meters in depth. This company is now producing about 10,000 tons a year of heavy oil from shallow wells, whereas light oils are found in the deeper beds of 1000 meters or more depth. This area is an extension of the Austrian oil fields at Zistersdorf. The heavy oil has a specific gravity of 0.940-950, is non-paraffinous, and contains no gasoline or kerosene. The lighter oils—specific gravity ranging from 0.825 to 0.930—contains some gasoline, kerosene and paraffin. The lubricating oils produced from these crudes are of average market quality; however, high grade lubricants are not producible.

Statistics for Czechoslovakia are given in Table 1.

Definite figures for 1937 are not available. However, based on official statistics for the first eleven months and estimating the production and imports for December, the following estimate for all 1937 is given.

Production . . 17,870 metric tons
Imports . . . . 448,454 metric tons

In regard to 1937 imports, these consisted more largely of crude oil and to a less extent of gasoline than in other recent years. The principal imports of gasoline are from Rumania and Poland, while those of crude oil and lubricants are from the United States. The total annual capacity of all refineries in Czechoslovakia is about 900,000 tons. Since the government desires to have adequate refining facilities within the country, the import duty structure is such that it pays to import crude oil and to refine most types within the country.

Seek New Fields

Attempts are continually being made to uncover new sources of crude oil, this activity having gone on for many decades. No official statements are available as to the immediate prospects of such exploration. Production is supervised by the Czechoslovak Ministry of Public Works which recently delegated the Czechoslovak Geological Institute to analyze samples of any mineral oils which may be found in the country.

	(In Metric Tons)				
	1932	1933	1934	1935	1936
Production:					
Crude Oil	18,484	17,776	25,971	19,946	18,664
Imports:					
Petroleum Products	398,455	362,777	370,608	399,855	403 465
Imports:					
Crude Oil	94,742	101,036	121,150	156,640	162,611
Gasoline	224,242	164,305	165,690	163,988	180,881
Lubricants	19,201	15,524	14,320	13,924	14,900
Gas Oil	36,856	57,026	43,230	40,991	37,045

Acknowledgements for the material on Czechoslovakia are given to the American Consulate General, Prague, Czechoslovakia.

Canada

Important developments in Alberta and particularly in Turner Valley during the year eclipsed all other Dominion areas, but advances were made and more are in prospect.

IMPORTANT developments during the past year in Alberta, particularly in Turner Valley, almost eclipsed production activity in other parts of Canada. But with the exception of one region, important advances were made and indications point to even greater activity during the coming season.

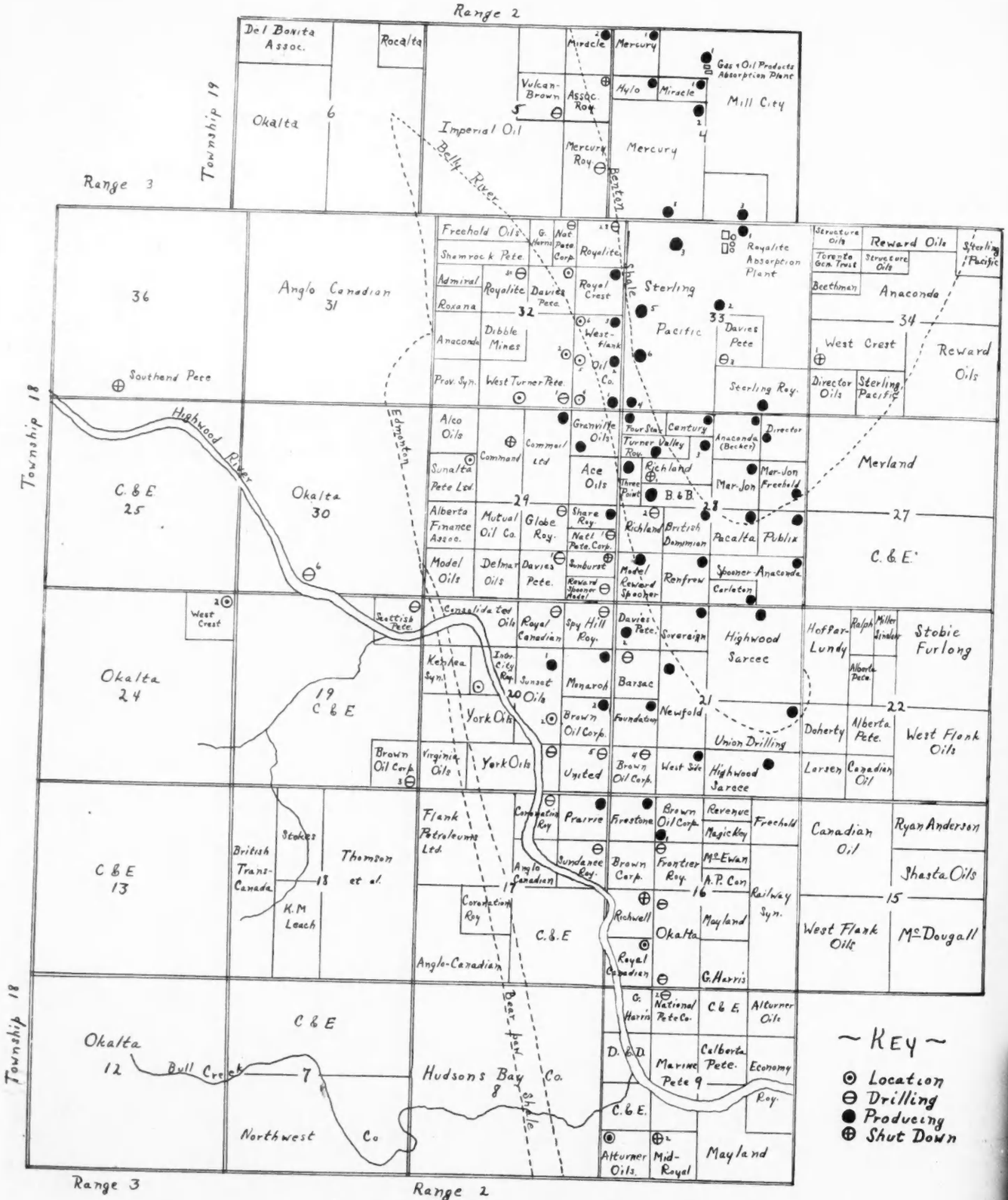
West of Alberta, on the Flathead or Sage Creek structure, extreme southwestern British Columbia, a wildcat temporarily idle at 6836 feet late in January was commanding unusual interest. It is being drilled by Columbia Oils, Ltd., and may have to be carried to 8000 feet for the limestone, compared to 6500 feet where the Madison is encountered in Turner Valley, 150 miles to the northeast. The test is amply financed and is to continue to at least the 8000-foot level. Production in this area would map out a large triangle in the Eastern Rockies of which the Cut Bank region of Montana would be the third corner, and indicate an extension of the oil region border-

(Pollard's, Calgary)

The cause of the present Turner Valley drilling campaign, Turner Valley Royalties, Ltd.'s 1, blowing in as the area's first crude producer in June, 1936. Initial production was about 1500 barrels daily, and present production is based on a potential of 1221 barrels. The discovery was acidized with successful results during the past summer.

ing the Rockies and extending down to the Mid-Continent area in the United States. Encouraging shows have been reported at Columbia Oils' wildcat. Drilling is largely through hard rock, more difficult than Turner Valley, which is underlaid by spasmodic hard rock strata.

Just to the east of Alberta, practically on the Saskatchewan line and 300 miles north of the International boundary, the field opened a year ago near Lloydminster by Triangle Gas & Oil Company is the scene of considerable exploratory work. The well was a gasser, but in the opinion of many geologists, the area holds oil possibilities. A number of leasing deals have been consummated in the region during



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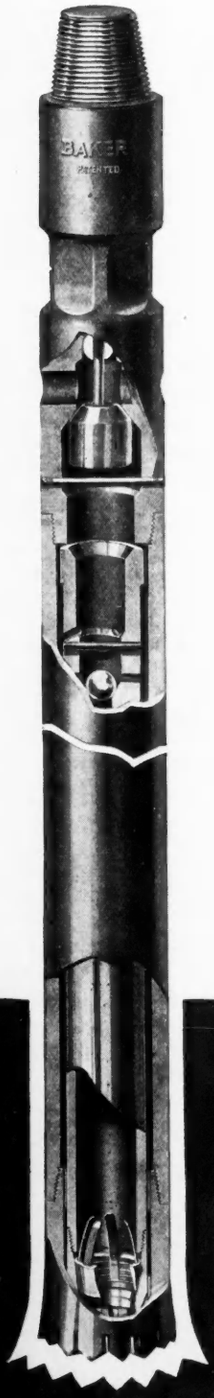

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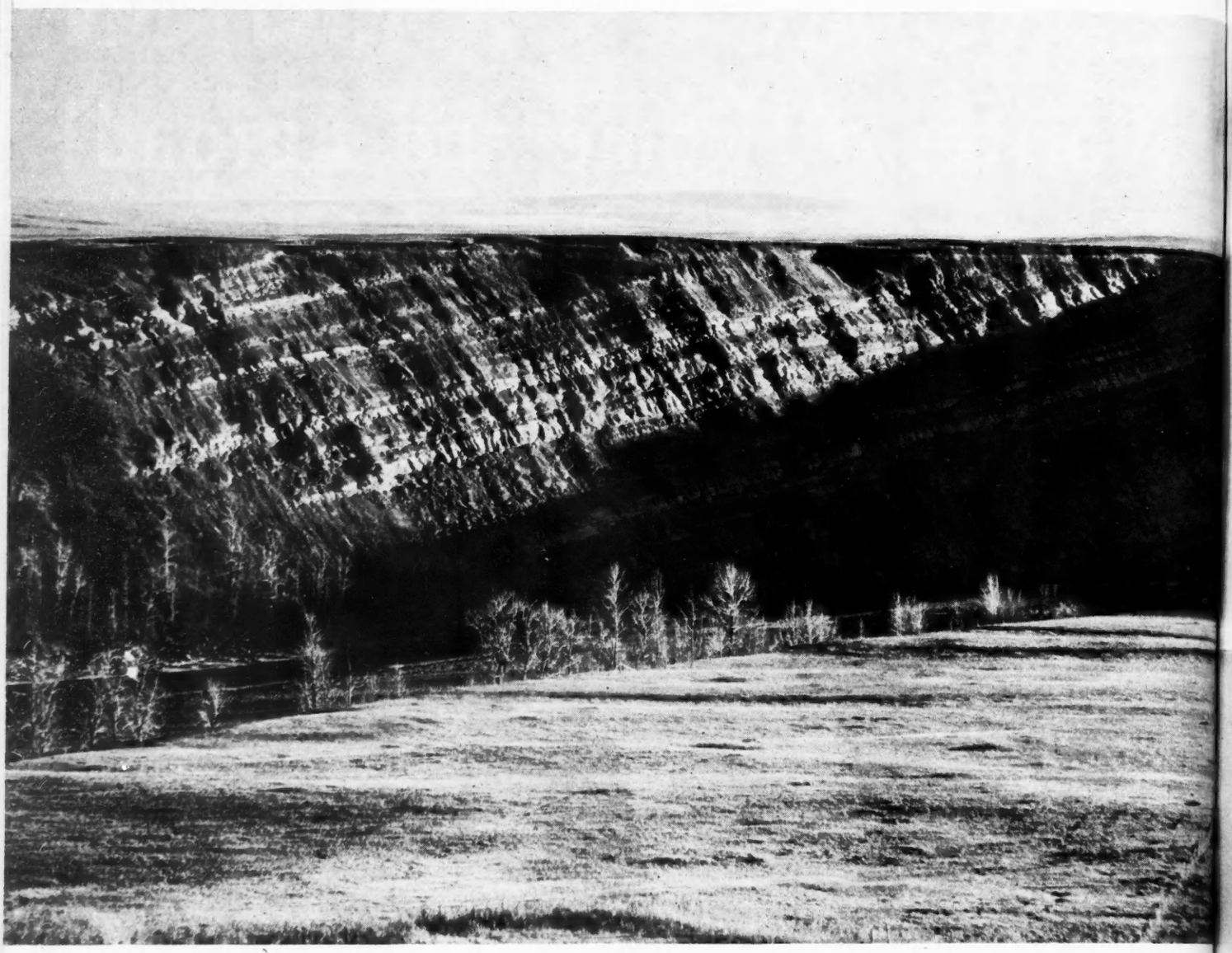


The east outcrop on the Highwood River, South Turner Valley. (Pollard's, Calgary.)

the past few months which indicate that exploratory work projected for the coming season may bring this region into prominence.

Southeastern Saskatchewan and adjoining Southwestern Manitoba is not without its oil interest, but the greater part of that interest is now centered across the line where Standard Oil Company of California is nearing the 7000-foot mark on the first deep wildcat in that general region. It is on the large Nesson anticline, east of Williston, North Dakota, and if successful will open a wide area for extensive deep exploration running well through adjoining southern areas of the two Canadian provinces.

Largest Untested Area

In view of commercial production in the beds of Mississippian Age or older on the Baker-Glendive anticline in southeast Montana and the gas production in the Lloydminster area, a successful strike at Standard Oil Company of California's North Dakota test will give strength to some opinions that an area 600 miles long and 500 miles wide roughly defined by these markers is potential oil and gas territory—probably the largest untested area on the North American continent. For the most part, this large area is covered with glacial drift and would have to be determined by geophysical and subsurface geological methods, but parts can be defined by surface geology. Seepages in Manitoba and showings at the few wells thus far drilled indicate that such beds are possible petroliferous zones. Some drilling has been done in Southwestern Manitoba by Natural Gas & Oil Company, Hydro Carbon Products Company and Lisgar Oil Company, but nothing of importance has developed. The geo-syncline between the Rocky Mountains and the Canadian shield, far to the east, was formerly thought to be too devoid of folding to be favorable for gas and oil. The Nesson anticline and other folds on the United States side, however, as well as the Lloydminster structure, tend to disprove this contention.

Continuing east to Ontario, the decline of the old fields at Oil Springs and Petrolia in the southwestern part of the Province, producing about 160,000 barrels a year, may be temporarily checked by acidization and secondary recovery methods. McIntosh Oil & Gas Company introduced acid treatment in this area for the first time early last year, and the results

were described as most favorable. Wells which had been producing for more than 60 years, and lately at the rate of ½-barrel a day, were boosted to an initial of 10 barrels a day and the settled yield was reported not far below that figure. Production is from shallow depths, the tests of McIntosh Oil & Gas Company averaging less than 500 feet. The wells are drilled with a portable outfit at a cost of about $800, with acid treatment costing about $250. The first well was drilled in the Petrolia area in 1861, less than two years after the Drake discovery in Pennsylvania. G. S. Hume, of the geological surveys branch of the Dominion Department of Mines and Resources, believes there is little likelihood that Ontario will ever be able to increase production of oil.

South Ontario Importance Increasing

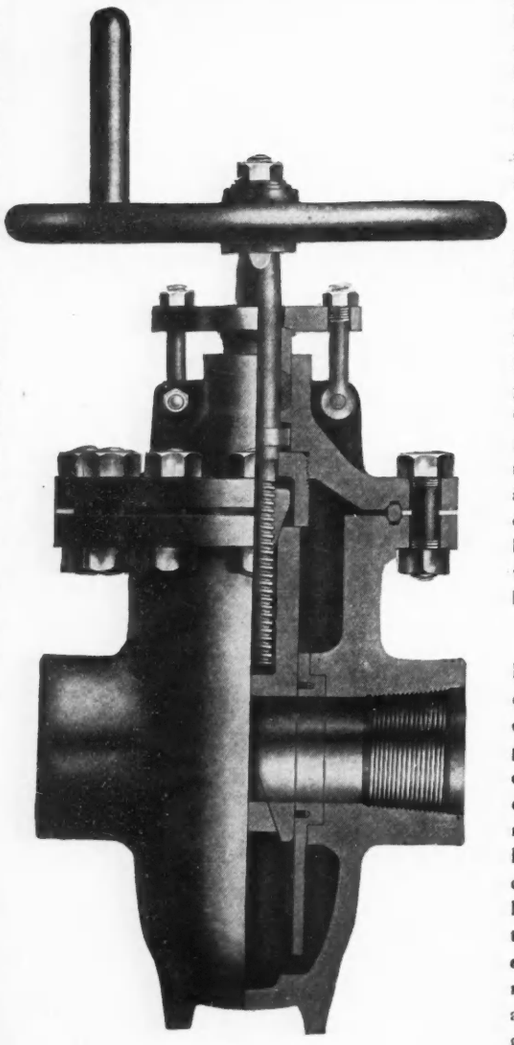
Still farther south in Ontario, Kent County has been increasing in importance both as an oil and gas area. The Dover Township field, which has been producing from the Trenton formation at about 3300 feet for 20 years, has been given several important extensions. The latest was Knight, Rawlings & Stover's test on Lot 5, Front Concession, Raleigh Township, near Prairie Siding, 10 miles below Chatham on the Thames River. Initial production was 1,250,000 cubic feet of gas and some oil from 2925-35 feet, which was increased to 2,000,000 cubic feet with a shot of 60 quarts of nitro-glycerine. It extended the field 3¾ miles east of the original discovery, making the field 4½ miles from east to west. It is on the down-throw of a side of a fault plane and probably not more than half a mile from north to south. The test was the third successful completion on the Raleigh Township side of the Thames, the other two being divided between oil and gas wells. Oil is of 41 degrees Baume, commanding a price of $2.17. Gas is sold to Union Natural Gas Company, discoverer of the field in 1917, and Southern Ontario Gas Company. A well is to be drilled in the center of a 1000-acre block of leases held by Prairie Gas & Oil Company, about 2000 feet east of the Knight et al well. If successful, it would prove a further extension of that distance.

Natural gas activity in Ontario has been increasing, much of it in the Brownsville area of Oxford

Richland Oils, Ltd.'s 2, nearing completion in January and given excellent chance of record production. (Pollard's, Calgary.)

the Popularity of W-K-M

W-K-M GATE VALVE



Through-Conduit opening eliminates restriction of flow, and seat faces are not exposed to pressure. Any sediment carried down with gate is automatically flushed out when valve is opened. Smaller area exposed to pressure, confining flow to minimum space. Body serves as grease chamber, and all moving parts work in grease bath. Parallel gates expand uniformly, and double wedge construction assures positive seal-off on both sides in either open or closed position. Patented bronze wipe-and-seal rings clean gate and seats at each operation. Bronze seats, extra large, are renewable.

Une ouverture à conduit d'un bout à l'autre supprime la restriction de l'écoulement, et les faces de sièges ne sont pas exposées à la pression. Tout sédiment entraîné avec la vanne est rejeté automatiquement quand la soupage s'ouvre. Plus petite surface exposée à la pression, limitant le courant à un minimum d'espace. Corps sert de chambre à graisse, et toutes les pièces mobiles sont dans un bain de graisse. Les vannes parallèles s'écartent uniformément, et une construction à double coin assure une obturation positive des deux côtés tant en position ouverte que fermée. Des bagues brevetées en bronze type râcle-et-obture nettoient la vanne et les sièges à chaque opération. Sièges de bronze, extra-grands, renouvelables.

La abertura de conducto expedito suprime la restricción de la corriente y las caras de los asientos no quedan expuestas a la presión. Todo sedimento llevado por la bajada de la compuerta sale automáticamente cuando la válvula de abre. La menor superficie expuesta a la presión confina la corriente a un espacio mínimo. El cuerpo sirve de cámara de grasa y todas las piezas móviles funcionan en un baño de grasa. Las compuertas paralelas se extienden uniformemente y la construcción de doble cuña asegura un cierre positivo en ambos lados, tanto en la posición abierta como en la cerrada. Anillos de bronce patentados de tipo de restregadura y cierre, limpian las compuertas y los asientos en cada operación. Los asientos de bronce de gran tamaño, son renovables.

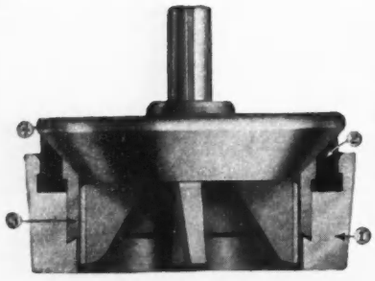
CASING CENTRALIZER

Holds casing and cementing shoe in exact center of hole, allowing cement to flow entirely and evenly around casing. Also effects a whirling action by the spiral blades, avoiding channeling of cement. Cleans the well bore, permitting thorough penetration and bonding of cement. Spiral design of blades contacts entire circumference of hole and cannot plow furrows or keyseats in the wall. Easily run in and pulled from hole.

Maintient le revêtement et le sabot de cimentation au centre exact du trou, ce qui permet au ciment de couler entièrement et également au tour du revêtement. Effectue aussi un tournoiement par les lames spirales, ce qui évite d'échancrer le ciment. Nettoie le trou du puits, permettant la pénétration et la prise du ciment. Le tracé spirale des lames prend contact avec la circonférence entière du trou et ne peut pas creuser des sillons ou des portées dans le mur. Facile à descendre ou à sortir du trou.

Mantiene el revestimiento y la zapata de cementación al centro exacto del agujero, lo que permite introducir el cemento de una manera uniforme alrededor del revestimiento. Efectúa también un movimiento giratorio, mediante las paletas espirales, lo que evita que el cemento se canalice. Limpia el agujero del pozo, lo que facilita mucho la penetración y colocación del cemento. La forma espiral de las paletas tiene contacto con la completa circunferencia del agujero y no puede ranurar o dañar de otra manera la pared. Puede introducirse en el agujero y scarse de él con suma facilidad.

TWIN-SEAT SLUSH PUMP VALVE



Doubles the life of slush pump mud ends, and cuts repair costs 30 to 40%. Bronze seat body fits into pump deck and stays there, eliminating frequent pulling of seats and resulting wear of fluid end. Wear is thrown on the replaceable rubber and steel insert seats.

Double la vie utile des extrémités à boue de pompe à limon, et réduit les frais de réparation de 30 à 40%. Le corps de siège en bronze s'adapte dans le pont de pompe et y reste, supprimant le tiraillement fréquent des sièges et l'usure résultante du bout à liquide. L'usure est reportée sur le caoutchouc remplaçable et les sièges rapportés en acier.

Aumenta al doble la duración de los extremos de la bomba de lodo o barro y reduce los gastos de reparación de 30 a 40%. El cuerpo del asiento de bronce se adapta al puente de la bomba y colocado aquí evita el frecuente desprendimiento de los asientos y el resultante desgaste del extremo líquido. El desgaste recae sobre la pieza de caucho reemplazable y los asientos de acero insertados.

W-K-M Company, Inc.

OIL FIELD, PIPE-LINE & INDUSTRIAL EQUIPMENT

HOUSTON, Texas, U. S. A.

Export Office: 74 Trinity Place, New York

Cable Address: "WILKOMAC"

PRODUCTS

Knows no National Bounds

ROTARY FRICTION SLIPS

Provides more gripping area, greater holding capacity, and smooth action. Takes hold and releases instantly, and will not slip, cut or bottleneck the pipe. Extremely light and easy to handle. Highly flexible. Segments easily replaced on derrick floor at small cost, making slips same as new. Made of highest quality one-piece, drop-forged and heat-treated segments.

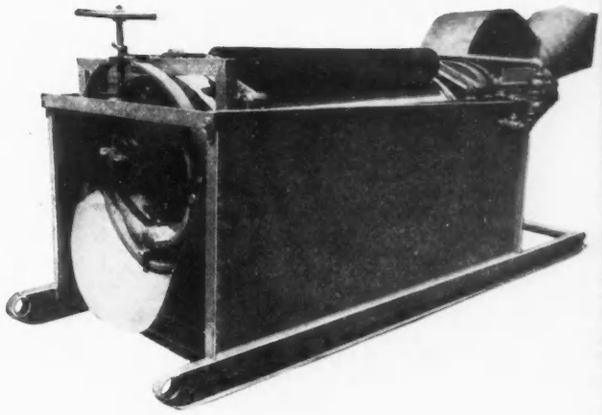
Fournit une plus grande surface d'adhérence, une plus grande capacité de contenance et une action douce. Saisit et relâche instantanément, et ne lâchera pas, ni ne coupera ou coincera le tuyau. Légèreté extrême et facilité d'emploi. Très souple. Segments faciles à remplacer sur le plancher de tour de sondage à peu de frais, rendant les fourreaux comme neufs. En segments de haute qualité, en une seule pièce, forgés au marteau-pilon et traités thermiquement.

Provee una mayor superficie de adherencia, una mayor capacidad de sujeción y una acción suave. Sujeta y suelta instantaneamente, sin resbalarse y sin cortar o dañar el tubo. Extraordinariamente liviano y fácil de manejar. Bien flexible. Los segmentos pueden reemplazarse fácilmente en el piso de la torre, a poco costo, dejando los sujetadores lo mismo que nuevos. Se hace de segmentos de superior calidad, de una sola pieza, forjados a martinete y tratados termicamente.

MUD SCREEN

The proven method of removing cuttings from mud without the use of steam turbines or electric motors. Requires no motive power other than the natural flow of mud returns from the well. Screening done by rotation of screening drum, without high speeds or vibration. Two separate screening surfaces used, one removing coarse shale and the other removing finer shale particles and damaging sand.

La méthode démontrée d'extraire les débris de la boue sans l'emploi de turbines à vapeur ou de moteurs électriques. Ne demande pas d'autre force motrice que le courant naturel de boues de retour venant du puits. Tamisage par rotation de tambour de tamisage, sans grandes vitesses ou vibration. Emploi de deux surfaces de tamisage séparées, dont une enlevant les schistes grossiers et l'autre les fines particules de schistes et sable endommageant.



El método demostrado de extraer los desechos del lodo, sin el empleo de turbinas de vapor o de motores eléctricos. No requiere otra fuerza motriz que la corriente natural del lodo de regreso del pozo. La cribadura se hace por la rotación del tambor del aparato, sin grandes velocidades o vibración. Se emplean dos superficies de cribadura separadas, la una para quitar los esquistos gruesos y la otra para quitar las partículas más finas y la arena dañina.

PIPE CLEANING MACHINE

Cleans old or new lines, 2 or more miles daily, traveling the made-up line under its own power. Hundreds of toothed cutter wheels remove all scale, rust, dirt, etc., and a series of steel wire brushes leave a smooth, bright surface. Special scraper knives remove felt or wrapping. Built in a range of sizes to clean 2" to 24" pipe. Readily convertible from one size to another, or from traveling to stationary machine.

Nettoie les conduites anciennes ou neuves, à raison de 20 milles ou plus par jour, parcourant la conduite posée par sa propre énergie Des centaines de roues coupantes à dents enlèvent toute incrustation, rouille, crasse, etc. et une série de brosses métalliques laissent une surface lisse et brillante. Des couteaux racleurs spéciaux enlèvent le feutre ou revêtement. Choix de tailles pour calibres de tuyau de 2 à 24 pouces. Facile à convertir d'une taille à l'autre, ou de machine mobile à fixe.

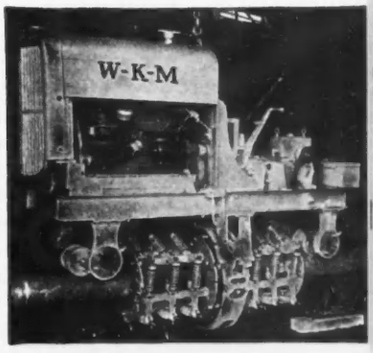
Limpia tuberías nuevas y viejas, a razón de 2 millas o más al dia, recorriendo la línea por limpiarse, bajo su propai energía. Centenares de ruedas dentadas y afiladas quitan toda la costra, moho, mugre, etc., y una serie de escobillas de alambre de acero dejan la superficie bien limpia y brillante. Cuchillas raspadoras especiales se encargan de quitar el fieltro y otros forros exteriores. Se ofrecen en varios tamaños, para limpiar tuberías de 2 a 24 pulgadas de diámetro. Fácilmente se puede convertir de un tamaño a otro, lo mismo que de máquina móvil a máquina fija.

TUBING SLIPS

Built to fit 1¼" to 4" tubing, in regular type (for medium depths) and deepwell type for long strings. One man handles it. Made in 4 and 6-segment construction forged steel throughout. Reduces tubing pulling time 25%, with proportionate oil savings.

Prévus pour tubage de 1¼ à pouces, en type normal (pour profondeurs moyennes) et type de puits profonds pour longues colonnes. Un homme suffit à la manoeuvre. Rien qu'en acier forgé en structure de 4 et 6 segments. Réduit le temps de traction de tubage de 25% avec économies de pétrole en rapport.

Para adaptarse a tubos de 1¼" a 4", en tipo normal (para profundidades medianas) y en tipo de pozo profundo para series o columnas bien largas. Un hombre es suficiente para su manejo. Construcción de 4 y de 6 segmentos, de acero forjado. Reduce el tiempo de extracción de la tubería como 25% y produce correspondientes economías en petróleo.



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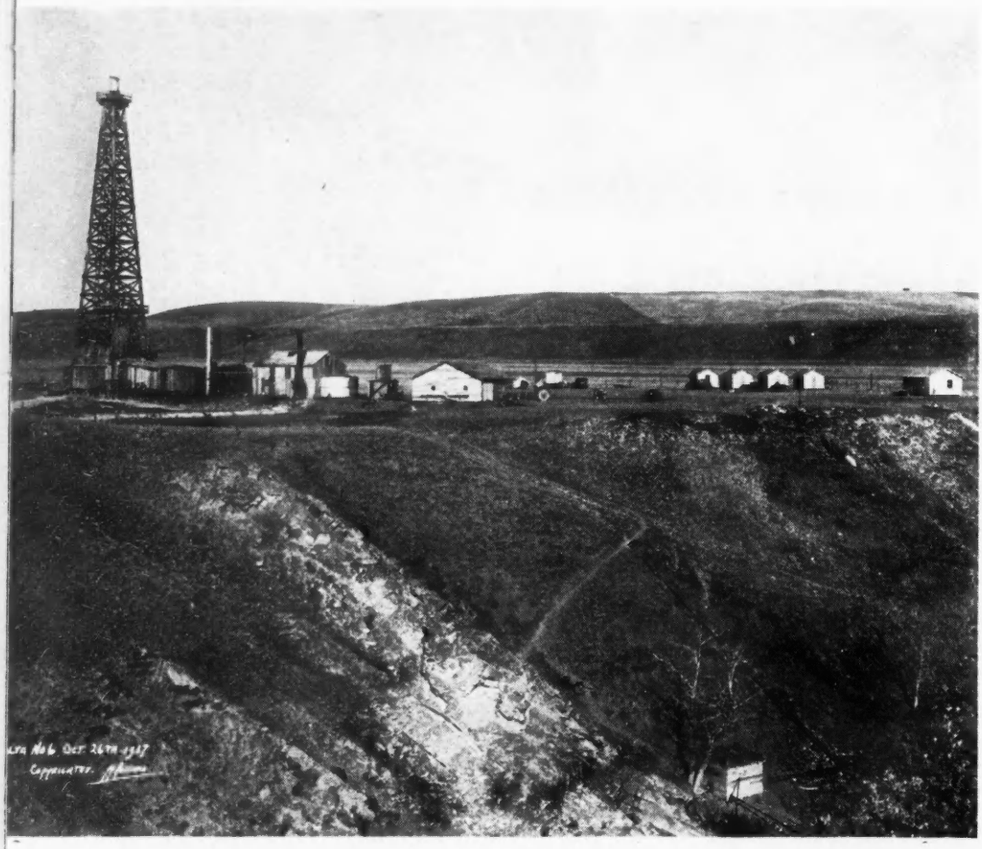

(Pollard's, Calgary)

Okalta Oils Ltd.'s 6, which was drilled to 3800 feet with standard tools and was to continue to the Madison limestone with a new rotary outfit. The change-over was made late in January. The well is shown shortly after operations started last fall. It is on Legal Subdivision 3, Section 30, Range 2, West of the Fifth, almost two miles of the proven area of Southern Turner Valley.

County, where the producing horizon is less than 1000 feet.

New Brunswick is the only dark spot on Canada's oil map, activity being at a low ebb and production dropping.

Alberta Has Record Year in 1937

Forty-three wells were drilled to completion in Alberta last year, establishing a production record unparalleled in Canadian oil history but nevertheless certain to be surpassed during 1938.

Thirty-four of the wells were successful completions and 1 a dry hole in the Turner Valley field, 50 miles southwest of Calgary; 3, including the discovery, were drilled on the Taber structure, in the extreme southern part of the Province; one opened the Battleview structure, northeast of Wainwright; 1 confirmed the Moose Dome area; 1 brought renewed activity to the Dina field, while the remaining 2 were wildcat failures, 1 in the High River area east of Turner Valley and the other in the Coutts area near the southern border.

The past year saw Turner Valley, now the Dominion's principal oil field, emerge from a naphtha area to a crude oil field, all but 2 of the successful completions being crude producers. Since drilling in Turner Valley Royalties, Ltd.'s 1 as the first oil producer in June, 1936, a total of 35 oil producers have been completed in the field. Thirty-two of these were drilled during 1937 in addition to 2 naphtha wells.

Production, as indicated by Provincial government tests conducted late in December and early last month, ranged from 10 to 2998 barrels daily. Wells capable of producing over 100 barrels daily are held to an allowable of 42 percent because rapid increase in the field's production late last year overflowed both the market and facilities to move the crude from the field to Calgary, refinery and shipping center.

The year's drilling campaign has been concentrated in Southern Turner Valley and proved an area 4 miles north and south, and 1 mile east and west. The eastern limit of the oil area seems well defined by naphtha producers drilled prior to last year, with the conflicting but nevertheless encouraging indication that a number of these naphtha wells are slowly changing over to oil production. This is especially true of a number of old wells in the eastern parts of Sections 21 and 28, Township 18, 2-w5, that were given acid treatment.

The southern and western boundaries of the oil area are a matter of conjecture, but indications are that marked extensions will be made in both directions. The largest producer in the field—Commoil, Ltd.'s 1, Legal Subdivision 15, Section 29, Township 18, 2-w5—is the most westerly completed well, while the field's seventh largest well—Prairie Royalties, Ltd.'s 1, Legal Subdivision 15, Section 17, Township 18, 2-w5—is the most southerly completed test. These wells are producing under potentials of 2998 and 1275 barrels daily, respectively. Both wells have been acidized.

Brown Oil Corporation's 3, Legal Subdivision 1, Section 19, Township 18, 2-w5, 2 miles south and ¾-mile west of the Commoil record producer, will tell much about the acreage west of the proven area. A half-mile farther west and a mile north, Okalta Oils, Ltd.'s 6 is active on Legal Subdivision 3, Section 30, Township 18, 2-w5, but will not command its share of interest until completion of the Brown well. Now below 3000 feet, it will complete about two months or more after the Brown.

Several wells are active south of Prairie Royalties' producer, the most southerly location being 3½ miles south and ¾-mile east. It is Davies Petroleums Ltd.'s 3, scheduled to start drilling operations during February on Legal Subdivision 7, Section 33, Township 17, 2-w5.

A late count of Turner Valley operations shows 47, of which 19 are drilling, 4 are temporarily idle, 1 preparing to resume, 2 spudding, 2 rigging, 3 with derricks up, 3 cellars and 6 locations, all in or to the south of Township 18 or in Southern Turner Valley, with an additional 4 wells drilling, 2 temporarily idle and 1 location north of Township 18. Location of many of the tests in and on the edge of proven territory indicated the num-

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TIMKEN
TAPERED ROLLER BEARINGS

ber of producing wells in Turner Valley will be doubled before mid-year.

Following are present Turner Valley producers, with daily potential production of each as established by government tests:

Company and Well	Barrels
Advance Oil Company, Ltd.'s 5-A	182
B. & B. Royalties, Ltd.'s 1	1,012
British Dominion Oil & Development Corp., Ltd.'s 4	30
Brown Oil Corporation, Ltd.'s 1	1,597
Brown Oil Corporation, Ltd.'s 2	628
Century Royalties, Ltd.'s 1	46
Commoil, Ltd.'s 1	2,998
Davies Petroleums, Ltd.'s 2	2,313
Firestone Petroleums, Ltd.'s 1	698
Foundation Petroleums, Ltd.'s 1	487
Four Star Petroleums, Ltd.'s 1	609
Granville Oils, Ltd.'s 1	377
Miracle Oils, Ltd.'s 2	57
Model-Spooner-Reward Oils, Ltd.'s 1	666
Model Oils, Ltd.'s 1	134
Model Oils, Ltd.'s 2	18
Model Oils, Ltd.'s 3	10
Monarch Royalties, Ltd.'s 1	591
National Petroleum Corporation, Ltds. 1	1,051
Prairie Royalties, Ltd.'s 1	1,275
Renfrew Royalty Company, Ltd.'s 1	15
Richland Oils, Ltd.'s 3	68
Royalite Oil Company's Sterling Pacific 3	302
Royalite Oil Company's Sterling-Pacific 4	2,052
Royalite Oil Company's Sterling-Pacific 5	1,599
Royalite Oil Company's Sterling-Pacific 6	2,141
Royal Crest Petroleums, Ltd.'s 1	567
Royal Canadian Oils, Ltd.'s 1	920
Share Royalties 1	484
Sunset Oils, Ltd.'s 1	1,000
Three Point Petroleums, Ltd.'s 1	478
Turner Valley Royalties, Ltd.'s 1	1,221
West Flank Oil Company, Ltd.'s 1	320
West Flank Oil Company, Ltd.'s 3	312
West Side Royalties, Ltd.'s 1	545
Total	26,803
Average	766

Forty-Acre Spacing

With a few exceptions, drilling in Southern Turner Valley thus far has been held to one test on a 40-acre tract. A notable exception is West Flank Oil Company, Ltd., which has 3 producing wells on its 80-acre tract, Legal Subdivisions 1 and 8, Section 32, Township 18, 2-w5, has derrick up for No. 4 and cellars dug for Nos. 5 and 6. Share Royalties and National Petroleum Corporation, Ltd., has split Legal Subdivision 8, Section 29, same township, and Sunburst Oil Company, Ltd., has split Legal Subdivision 1 of this section with Reward Oils, Ltd., Spooner Oils, Ltd., and Model Oils, Ltd., who are drilling a joint test. The 160-acre tract comprising Legal Subdivisions 11, 12, 13 and 14, Section 28, Township 18, 2-w5, is split up into 6 leases with as many producing wells, with another test temporarily idle.

An analysis of Provincial records reveals that the Commoil and Sunset wells, most westerly in Southern Turner Valley, are the deepest—both at 7475 feet—while Model Oils, Ltd.'s 1, in Northern Turner Valley, is the shallowest, producing from 5905 feet. The gas flow at Commoil was from 3,600,000 to 6,000,000 cubic feet a day during the 5-day testing period and the crude from 42.2 to 42.6 gravity.

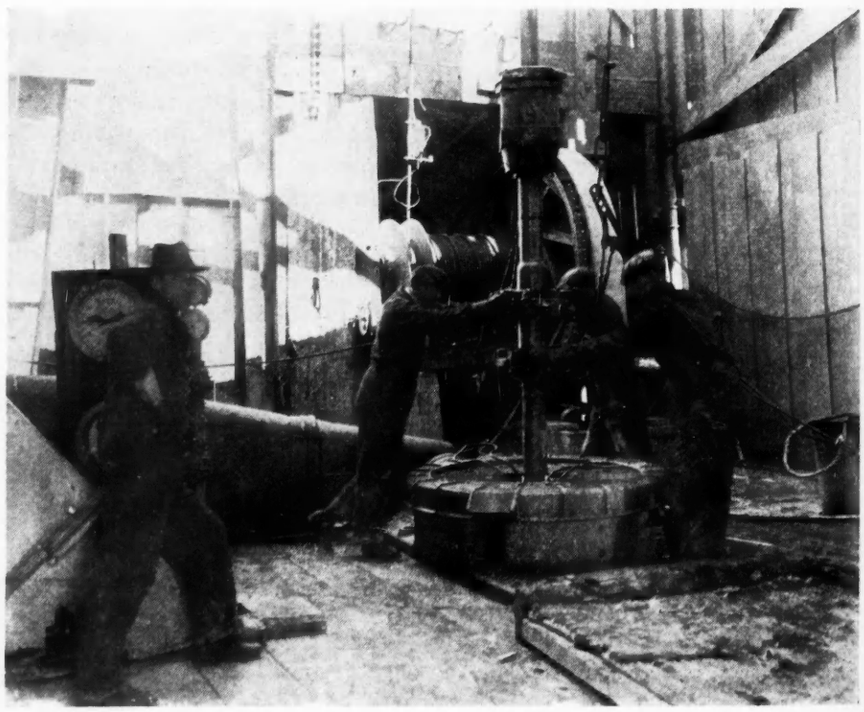
Royalite Oil Company's Sterling-Pacific 5, near the line which appears to mark the crude from the naphtha area in Southern Turner Valley, had the largest gas flow of the oil wells, reaching the 14,500,000 cubic foot mark on one day. Brown Oil Corporation, Ltd.'s 2, near the southern and western edge of the southern proven area, had the lowest gas pressure—450,000 cubic feet a day.

That Turner Valley will have a long life is indicated by the high production obtained at the discovery. Turner Valley Royalties, Ltd.'s 1, which the 5-day Provincial test showed to be among the field's leading producers although over 18 months old. Production during the 5 days was 1026 barrels, 1336 barrels, 1329 barrels, 1185 barrels and 1231 barrels. The gas flow ranged from 3,500,000 cubic feet to 8,800,000 cubic feet a day, and the gravity of the crude from 45.7 to 47.7.

Proration Follows Excess

Two major problems rose to plague Turner Valley operators during the past year, and both of them now appear to be approaching at least partial solution. Most immediate was proration which was instituted by Imperial Oil Company, Ltd., and the British American Oil Company, Ltd., principal buyers, on September 12 because rapid development in the late summer months more than saturated both the market and pipe line facilities for moving the crude from Turner Valley to Calgary. Proration was first set at 65 percent of potential, then dropped to 45 percent on November 1 and to 35 percent on November 15.

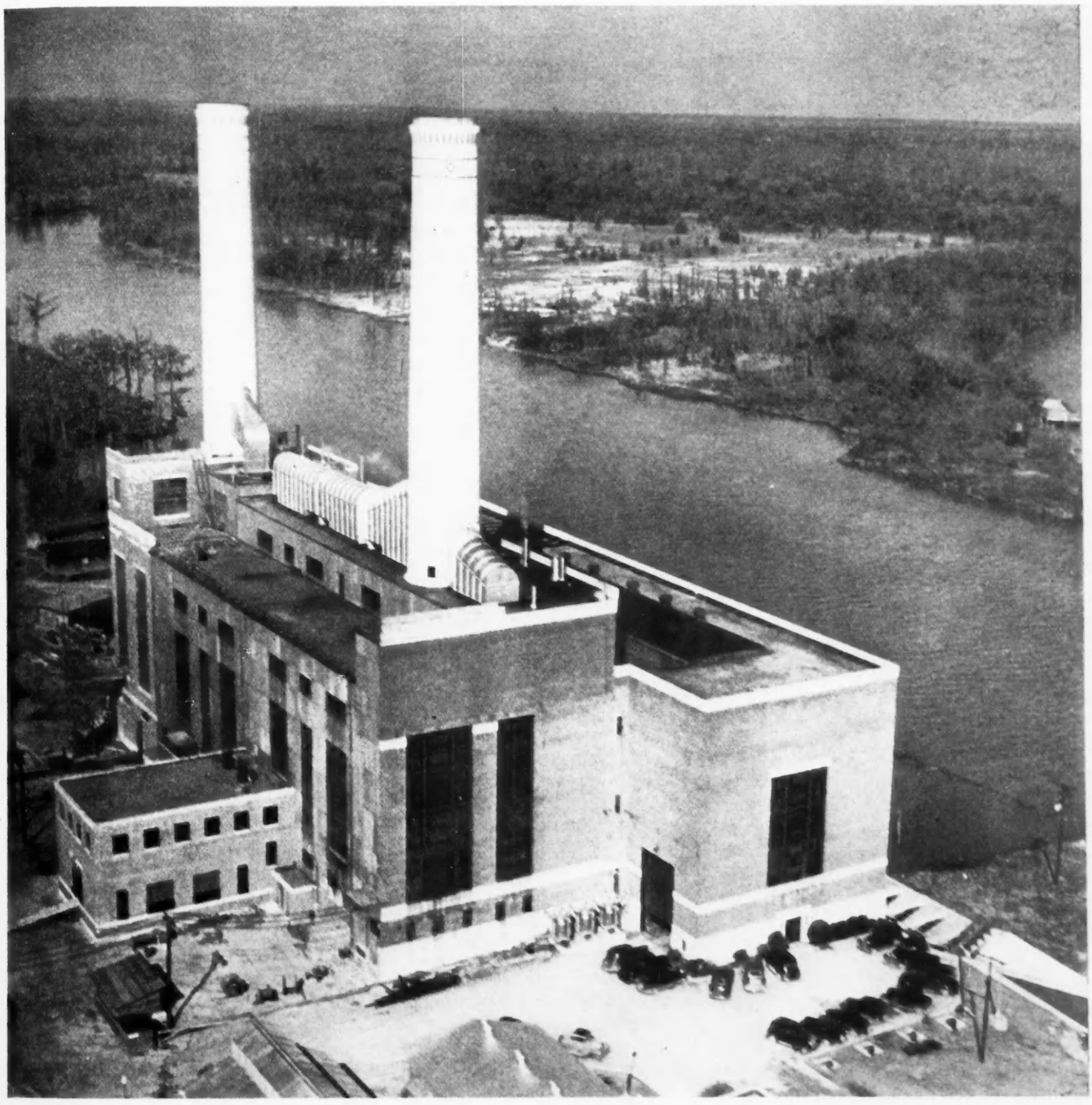
The action of the buying companies brought organization of the Petroleum Producers Association, a militant body of independent operators which is credited with doing much toward expanding the market for Alberta crude during the closing months of the year. In carrying out its progarm, the association has received the cooperation of the buying companies and the railroads. Imperial Oil Company announced an expansion program for its Calgary refinery and a program involving changes in equipment at its Regina, Saskatchewan, plant which will permit a switch from United States crude to the Turner Valley raw product. British American Oil Company discontinued purchases of Montana crude and is now refining Alberta crude exclusively for use in the prairie provinces. Other large marketing companies, probably influenced in part by a "Buy Gasoline Made from Alberta Crude" campaign, announced changes from gasoline formerly manufactured



Rotary rig used on Royalite Oil Company's Sterling-Pacific 6, which proved to be one of the field's largest producers. (Pollard's, Calgary.)

Neches Power Station Expands

Oil Industry Requirements in Southeast Texas and Southwest Louisiana Largely Responsible for Installation of New Unit



For almost a year workers have been busy installing a new generating unit of 27,500 Kw. capacity at the Neches Power Station, located on the Neches river a few miles below Beaumont, Texas. The picture shows progress on the project as it nears completion.

Of the 350,000,000 kilowatt hours of electricity sold by Gulf States Utilities Company in 1937, more than 85% were used by small and large commercial and industrial customers in the Texas and Louisiana territory the company serves. Three refineries of the Sabine district are big users of this central station power and the thirty or more producing fields and many pipe line stations in this section of the Gulf Coast account for another large slice of the total. The oil industry will use an even larger percentage of the total in 1938.

Address inquiries to Gulf States Utilities Company. General offices: Beaumont, Texas; Lake Charles, Louisiana.

from California and Rocky Mountain area crude.

The railroads, threatened with construction of a pipe line from Calgary to Regina, reduced tank car freight rates from Calgary to western points, while Royalite Oil Company, Ltd., constructed loops in its line from Turner Valley to Calgary and is installing additional pumping units which make possible the movement of more crude to a point from where it can be shipped to Western refineries.

These factors combined brought an upward revision in the allowable production to 42 percent on January 15. Completion of Imperial Oil Company's refinery projects, expected during the coming summer, and increased consumption of gasoline during the summer months, should bring a further upward revision in the allowable unless new production offsets the increased crude demand.

The producers association, with the cooperation of the Provincial government, was successful in obtaining an inquiry by the Dominion tariff board which may result in restrictions on importations of both crude and refined products from the United States. Hearings were held by the board late in January and early this month.

Pressure Decline

The second serious problem faced by Turner Valley operators is the rapid decline in gas pressure, blamed on about 75 naphtha producers on the east flank which were being permitted to run wide open. Approximately 200,000,000 cubic feet of gas is burned daily after being run through absorption plants for extraction of about 2000 barrels of naphtha. Owners of Turner Valley oil wells fear that continued depletion of gas at this rate will soon make it necessary for them to resort to artificial methods of bringing oil to the surface—a step that would bring difficulties because of the crooked condition of many of the holes.

The producers association suggested that the naphtha wells be shut down and their owners compensated 100 percent for their loss. The compensation would be paid by oil producers and a natural gas company obtaining its supply from Turner Valley. The plan has received the approval of Provincial authorities, and if not voluntarily adopted by all parties concerned will be made the subject of a measure to be brought before the Alberta legislature which convened this month.

The heavy production during recent months in Turner Valley brought two crude price reductions. The first cut, made in the fall, was favorably received by independent operators who felt it was necessary in expanding markets for Alberta crude throughout adjoining provinces. A reduction of 22 cents a barrel made January 5, however, was vigorously protested by independents who charged they were at the mercy of major companies. The reduction brought the price for average gravity crude of 46 degrees to $1.26 a barrel, and was made necessary, according to the Imperial Oil Company, by unstable conditions in the Montana crude market which were described as of a "disturbing and threatening character."

Wildcat Produces

Outstanding among the year's wildcat activity was opening of the Taber field in the southern part of the province by Plains Petroleum Corporation, Ltd.'s 1 from a stray sand at 3271 feet. Initial production was 40 barrels a day, sufficient to give the test a commercial rating, but operators had considerable trouble with water and the well is being plugged. The action, however, will not deter development of the area. Plains Petroleum Corporation has its No. 2 producing, is about to complete No. 3 and will soon start Nos. 4 and 5. Other companies, attracted by shallow production possibilities, have entered the area and will undertake development programs this year.

On the Battleview structure, northeast of Wainwright, Battleview Oils obtained an open flow of gas totaling 50,000,000 cubic feet a day at 1894 feet. The well has been shut in and other tests are to be made lower on structure in an effort to obtain oil. Pascalta Oils, Ltd.'s 2 early this year encountered the Battleview sand at 1876 feet and reported an encouraging oil showing.

An additional 16 Alberta wildcat structures have tests underway, all but a few of which will complete during the coming drilling season. Several are given excellent chances of obtaining commercial production, indicating Alberta may see an increase in oil fields during the year. Most of the wildcat tests are shut down for the winter.

Dark spot of the past year's wildcat activity was Arca Development Corporation's 1, Section 24, Township 18, 1-w5, in the High River area, which found salt water in the Madison limestone, the producing horizon in the Turner Valley field. It was drilled to 8991 feet, making it the deepest test to be drilled in the British Empire. Oil shows in the Upper Madison and in the Dalhousie sand did not give commercial production.

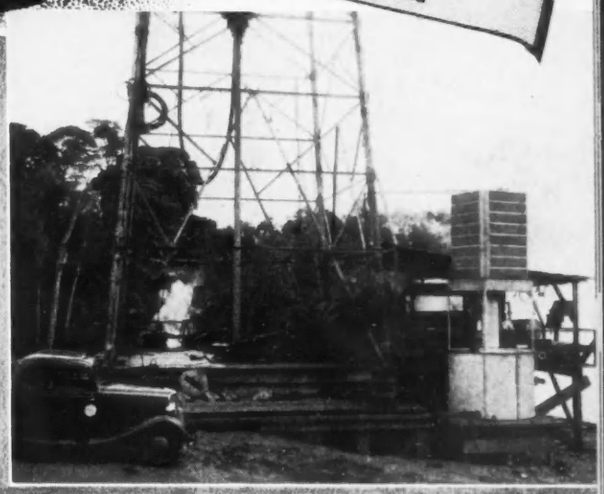
Fields in Alberta

According to J. L. Irwin, of the Alberta department of lands and mines, there are 13 oil areas or fields in Alberta. From north to south, they are:

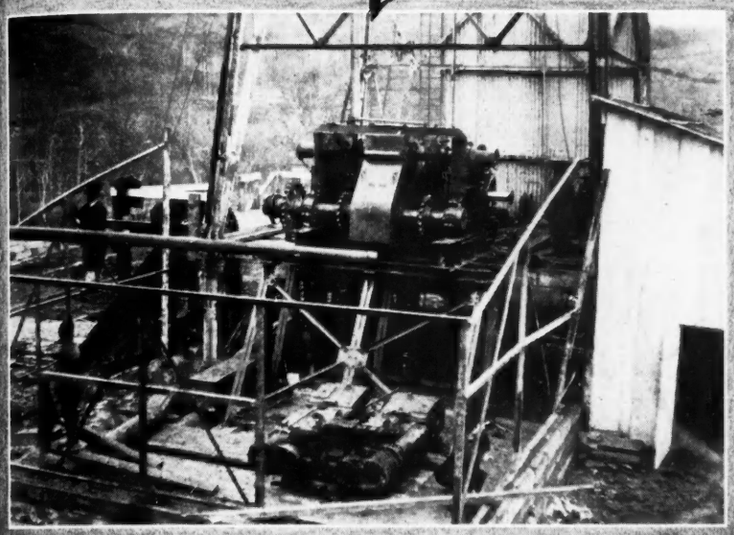
1. **Near the Town of Athabaska**—Oil of 12.1 gravity, Beaume, discovered at 1650 feet.
2. **Duvernay-Brosseau** — Oil-bearing sands commencing at 1490 feet and continuing to 2020 feet, not tested for productivity, wells abandoned.
3. **Wainwright** — Oil varying in gravity from 18 to 23 degrees is at present in production from depths ranging from 2100 to 2250 feet.
4. **Ribstone** — Oil discovered in wells at depths from 1800 to 1800 feet, 14.5 degrees.
5. **Oyen**—Low-gravity oil discovered at 3080-3133 feet but development discontinued.
6. **Turner Valley**—Oil ranging in gravity from 35 to 55 degrees is produced from four distinct oil sands above the limestone and from the limestone itself. Naphtha from the limestone is also produced in gravity from 60 to 75 degrees.
7. **Taber**—Wells in production at depths approximating 3200 feet with gravity at 29 degrees.
8. **Pekisko**—Crude oil, 40 to 45 degrees Beaume, proven at 3878 feet but not developed.
9. **Keho, near Lethbridge**—Oil of 32.4 degrees Beaume, proven at various depths below 3680 feet.
10. **—Skiff** — Oil of 20 degrees Beaume, proven at 3054 feet.
11. **Red Coulee, near Coutts**—Oil of 31 degrees Beaume at depths of from 2400 to 2500 feet.
12. **Twin River, 20 miles west of Coutts**—Gravity very similar to that produced at Red Coulee. Depth approximately 3875 feet.
13. **Spring Coulee, near Cardston** —Oil of light gravity encountered during drilling at 4550 and 4660 feet.

throughout the World for DEEP WELL DRILLING

UB-54 Emsco Drawworks and H-27½ Rotary Machine in service in Venezuela

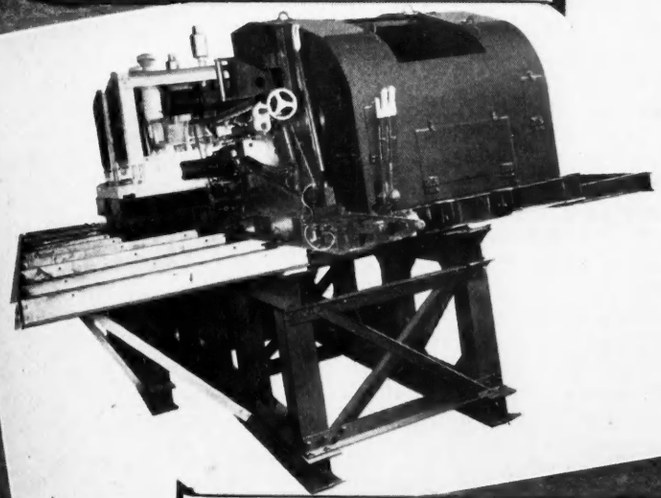


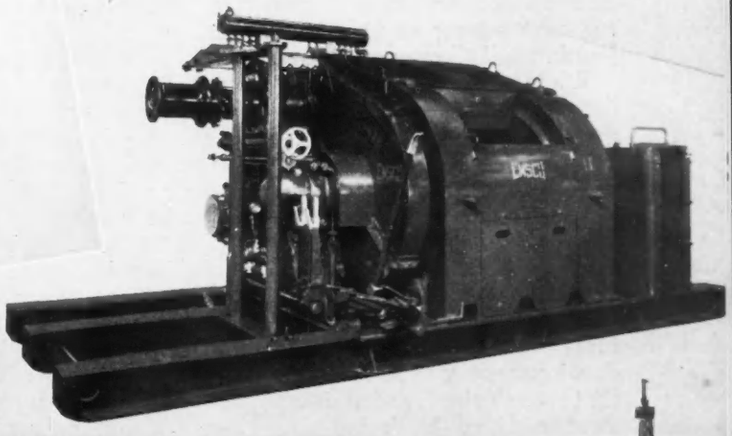
Rigging up UB-54 Emsco Drawworks in Roumania



UB-54 Emsco Drawworks and H-27½ Rotary Machine operating in Eastern Venezuela

Emsco dual motor drilling outfit consisting of PDM-46 drawworks, type H reverse and friction clutch and powered by two diesel engines





Heavy UBLS-54 Emsco Drawworks, suitable for any deep well operation

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Afghanistan-Iran

Concessions of American Interests are about to see first development—characterized as a long shot and a long pull

"IT IS a long shot and a long pull. But it is one worth plenty of geological work and exploratory drilling."

Those were the words used by a disinterested New York executive in describing the situation on two of the largest recently granted petroleum concessions in the world. the 240,000-square-mile concession of Inland Exploration Company in Afghanistan and the 190,000-square-mile concession of Amiranian Oil Company in eastern Iran.

Those same words, "a long shot and a long pull," might well have been used to describe in pre-drilling days the financial characteristics from an investment standpoint of history-making concessions such as the Barco down in Colombia, the Iraq Petroleum Company concession in Iraq, and some of the more attractive concessions in the Far East of Sumatra, Borneo and Java, to say nothing of that of Anglo-Iranian Oil Company in Iran.

While reconnaissance and some detailed geological work has been going on in the concessions of the two Seaboard Oil Company subsidiaries in Afghanistan and Iran for some months under the direction of Dr. Frederick G. Clapp of New York, interest of international oil circles was again drawn to the areas early in February, when the first concrete step toward actual development was taken. Early in that month the first batch of equipment left New York for one of the concessions. Seaboard Oil Company officials did not designate for which concession it was destined, but the assumption is that it will be one of the more promising spots found by the company's geologists in northeastern Iran. The time element in the Iranian concession stipulations are more stringent than those of the concession in Afghanistan. Hence, it is assumed Iran will receive the first wildcat, even though Amiranian Oil Company be forced to spot the location without benefit of as much geological data as it would like to have.

The first equipment shipped included miscellaneous tools and supplies. With selection of a proper drilling rig, one designed to go to about 7500 feet, scheduled for the latter part of January, it was assumed shipment of the rotary from New York probably would occur about mid-February. An internal combustion engine, or engines, will be used to drive the rotary. However, with a minimum of about two months required to get to the location, whether it be in Iran or Afghanistan, spudding is not contemplated before April.

Opinion is divided as to the actual economic worth of the concessions. Granted that there may be geological possibilities in the 430,000 square miles embraced, it is pointed out in some circles that tremendous reserves would have to be discovered to warrant the expense of building a pipe line outlet for such production, regardless of whether it were found in Afghanistan or in Iran.

Some say the engineering and expense, for labor and equipment, which would be involved in putting down a carrier more than 1000 miles long over the rough terrian would far surpass that required for Iraq Pipe Line Company's project. Topography of the countries south to the Gulf of Oman from the points in the concessions currently interesting the geological staffs of Inland and Amiranian is exceedingly rugged. The mountain passes are higher, and the routes to them steeper, than those encountered on the route traversed by the Iraq line.

That's what they say. They said just about the same thing about the proposed Barco concession line down in Colombia. Yet, a man who knows pipe line construction work and problems as few do, flew down to look over the Barco dilemma and came back to the United States to dumfound some of the more conservative with the remark that it was not such an impossible job after all. Yet again, to do a little more pro-and-conning, there is a vast difference between 225 miles of line, which is the estimated length of the Barco proposal from Corvenas to the concession, and the more than 1000 miles to that body of water just below the Persian Gulf from what are rumored to be the likely spots in the Iranian or Afghanistan concessions.

In December, 1937, THE OIL WEEKLY published an item which read as follows:

"Three geological parties in the field for Inland Exploration Company in Afghanistan, working under direction of Dr. Frederick G. Clapp, director of the company and consulting geologist

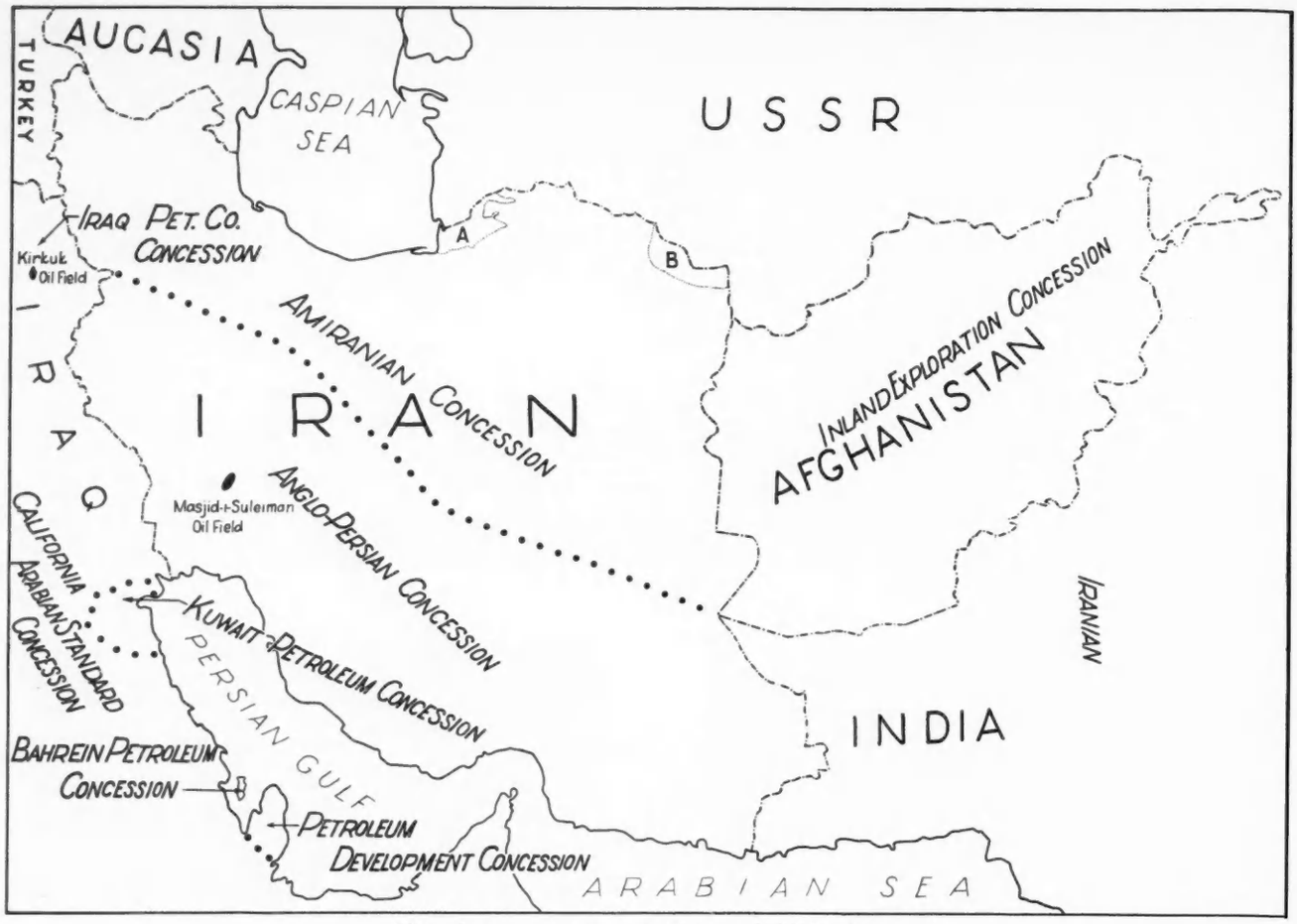
AFGHANISTAN-IRAN TERRAIN IS UNFRIENDLY

At right: Lavas on the road from Meshed to Chahroad in Iran.

Frank Reeves standing before an outcrop of Lias at Muzuran Pass, on the road from Meshed east to Sarakhs in Iran.

In front of Dr. Clapp's feet is shown the oil in saturated sandstone three kilometers east of Tirpul, Afghanistan.

View of salt mine on Kuh-i-Namak, Iran.



Map shows concessions in Iran and Afghanistan

of New York, are reported to have found several very promising structures. However, the concession covers practically all of Afghanistan and considerable additional geological work will have to be done before selection of the location for the first wildcat can be made."

Then, in the January 24, 1938, issue of THE OIL WEEKLY appeared the following item:

"Frederick G. Clapp, on behalf of Amiranian Oil Company and Inland Exploration Company, has made a hasty reconnaissance this fall of vast regions in northern Iran and northern Afghanistan where those companies operate concessions. Clapp returned to Kabul in December from a trip to remote sections in which Henry C. Rea, Howard M. Kirk and others have been conducting studies with highly favorable results. Clapp was proceeding, late in December, to southeastern Iran for detailed work for Amiranian Oil Company and Iranian Pipe Line Company, its subsidiary, which will pipe oil to the sea."

Hence, it would seem that sufficient has been found from the hurried work done to justify an exploratory drilling campaign in both countries. On the other hand, while practically nothing is specifically known with reference to findings of the geologists in Afghanistan, certain parties are inclined to believe the opportunities for worthwhile commercial production in the Iranian concession are practically restricted to two areas, designated roughly on the accompanying map as A and B in northern Iran, A bordering the southeastern tip of the Caspian Sea, and B lying east of there between Lutfabad and Sarakhs, the latter concession being bounded on the north by Russia.

The first of these, A, known locally as the Gurgan plain, is adjacent to the southeastern tip of the Caspian Sea, which forms its western boundary. On the south the area roughly follows the southern boundary of the Gurgan plain, including Asterbad and lower Gurgan, Findarisk, and almost running far enough south to take in Gunbadi Qabus. The western limits of the area, some say, is fixed by a point about 15 miles west of upper Gurgan. (There are two Gurgans on the map.) The northern boundary of "bright spot" A is furnished by the Atreck river, which forms also the boundary between Iran and Russia's Turkestan. The boundary line running in a general southwest-northeast direction is made clearer by the fact that the Elburz mountains on the south rise up to put a stop to the plain.

Recent Caspian deposits, alluvial matter from the Elburz mountains and loess cover area A to a depth of several hundred feet. The mountains to the south are largely highly folded Paleozoic sedimentary rocks. But the Gurgan plain rises to the east, and some of the older rocks found in the eastern part are said to correspond with the Apsheron-Akchagil of the Upper Pliocene series of the Baku region in Russia. It has been indicated that surface geology can do little more in this area and that other methods will have to be used.

Near the western border of prospect A and just south of the Russian border, near a small place called Nefte Dja, which is not shown on the map but is near the Caspian shoreline, a crater at the

Pressure Control Problems!

BLOWOUT PREVENTER AND STRIPPER SHAFFER COMBINATION ROTATING

THIS EQUIPMENT provides a means of drilling under pressure with speed and safety, using the type of drilling equipment already on the rig. Of outstanding importance is its adaptability for use with any kind of drill pipe—standard joint, upset or flush joint—with no change required except for the difference in sizes of Kelly and drill pipe used.

When used with a Shaffer High Pressure Drilling Hook-Up, as in Figure 2, it eliminates all hazard of blowouts while rotating, while going in or coming out of the hole, or while the tools and drill pipe are out of the well.

The body of the Shaffer Combination Rotating Blowout Preventer and Stripper houses a Rotating Packing Assembly for sealing around the Kelly during rotation, and below this is the Stripper for packing off around tool joints and couplings while the string is being run in and pulled out of the hole. The Stripper encircles and rotates with the Kelly and serves as an auxiliary packer for the Kelly during rotation. In pulling out of the hole the Stripper serves first as a seal for the Kelly and then for the drill pipe. As the drill pipe is pulled through the Stripper it constantly packs off around the pipe and allows the tool joints and couplings to pass through it by expanding and contracting as they enter and leave the Stripper Rubber. External upset and flush joint pipe will, of course, be packed off with even greater ease than standard coupled pipe.

Up to the point where it becomes necessary to remove the drilling bit, the Rotating Assembly and Stripper remain intact in the body of the Shaffer Combination Rotating Blow-Out Preventer and Stripper. When the drilling bit is pulled above the lower Cellar Control Gate, equipped with complete shut-off rams, this Gate is closed and the well shut in completely. This permits the opening of the Quick Releasing Bonnet and the withdrawal of the entire internal mechanism with the bit. (See Figure 3).

TYPICAL SHAFFER HIGH PRESSURE DRILLING HOOK-UPS . . .

. . . consist of "Screw Type" Cellar Control Gates and the Combination Rotating Blow-Out Preventer and Stripper (Fig. 2 on opposite page) and the "Flange Type" Cellar Control Gates with a Warren Control Head (Fig. 7, at right).

Out of the wide range of types of Shaffer "Safety Hook-ups" your control problems can be solved readily and economically. Protection is provided for both drilling and production of oil and gas wells against any pressure that may be encountered; minimum vertical space in the cellar is required; and safe, efficient operations are assured from the time drilling commences until after the well is put on production.

We invite correspondence giving all possible details of your pressure control requirements and problems so that Shaffer Engineers may give you definite and helpful recommendations.

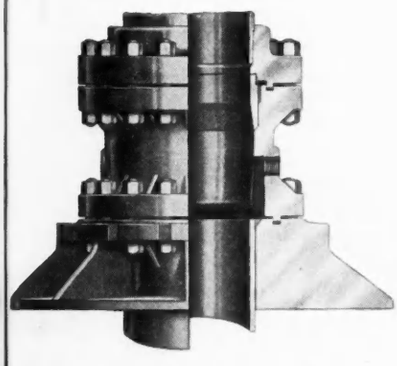


Figure 5. Shaffer Full Opening Spool Type Landing Head before inner casing is landed. Note the protector which prevents damaging the internal thread while drilling, and also forms a perfect guide for tools entering or leaving the hole.

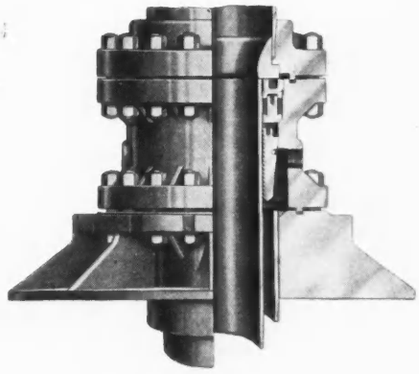


Figure 6. Shaffer Full Opening Spool Type Landing Head with casing landed. The inserted guide (locked in place by the drilling companion flange) serves to guide tools into the inside landed casing.

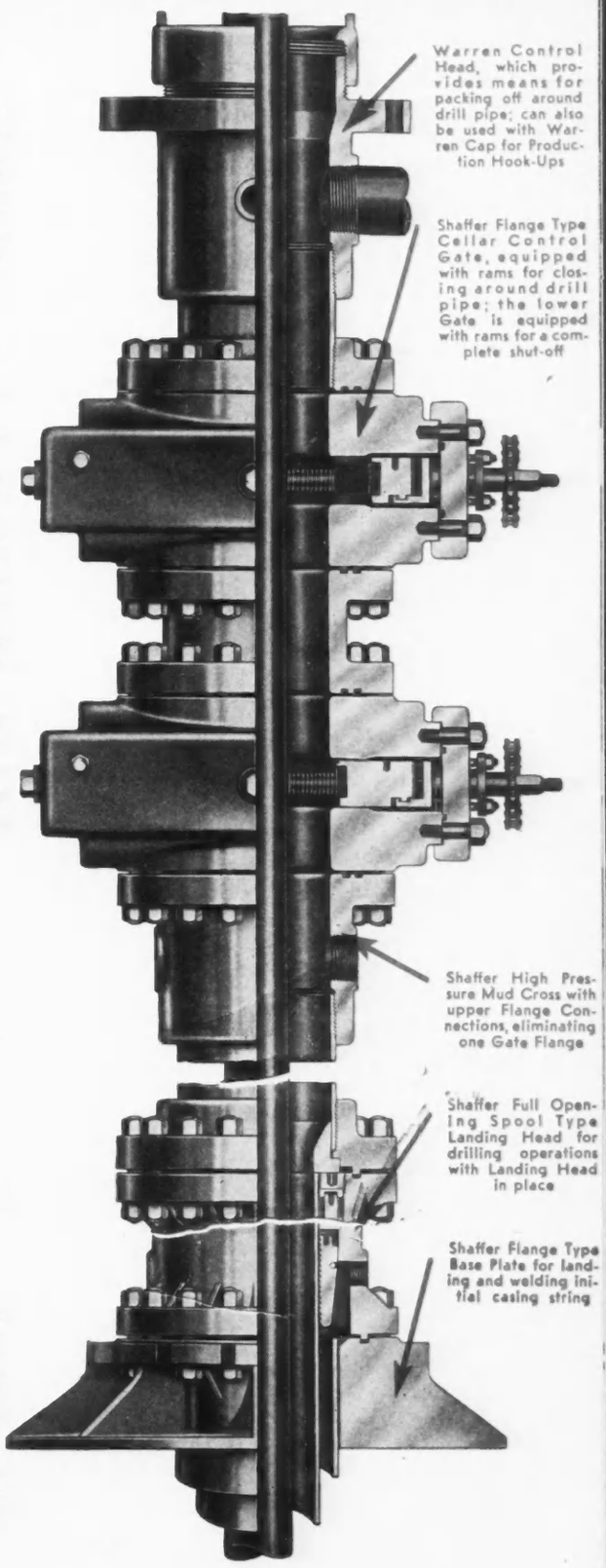

Warren Control Head, which provides means for packing off around drill pipe; can also be used with Warren Cap for Production Hook-Ups
Shaffer Flange Type Cellar Control Gate, equipped with rams for closing around drill pipe; the lower Gate is equipped with rams for a complete shut-off
Shaffer High Pressure Mud Cross with upper Flange Connections, eliminating one Gate Flange
Shaffer Full Opening Spool Type Landing Head for drilling operations with Landing Head in place
Shaffer Flange Type Base Plate for landing and welding initial casing string

Figure 7. Shaffer High Pressure Safety Hook-Up employing Flange Type Shaffer Cellar Control Gates with Warren Control Head for high pressures.

SHAFFER

Specialists in

FISHING TOOLS THAT EXCEL

Described in detail on Pages 1863 to 1898 of the 1938 COMPOSITE CATALOG

top of a mound discharges inflammable gas with a good oil odor up through a small lake of salt water in the crater. This seep may represent the crest of a gently arched fold. However, in the light of current data, this is assumption purely, inasmuch as the only contributing evidence is a limited observation of dips away from the mound. Nefte Dja seems to be about the only piece of concrete evidence of the existence of petroleum in prospect A.

The foregoing information is strictly unofficial and does not come from either of the companies involved in development of the concessions or from their parent organization, Seaboard Oil Company.

Development of most anything that might be found in the Gurgan plain would be strictly a dry weather proposition, so far as hauling in materials is concerned. Hauling over current routes of travel, in their present condition, in the rainy season would be almost unthinkable.

Assuming oil could be found in the vicinity of the seepage at Nefte Dja, assuming commercial production could be developed, what would the operators face? Three alternatives are presented: (1) A hookup with Anglo-Iranian Oil Company to receive the oil at a point near Masjid-i-Sulaiman field to the southwest or at the Kermanshah refinery west of southwest of purported hot spots of the concessions; (2) Some sort of a deal with the Russians to pick up the oil on the Caspian shore; (3) Build lines from the productive sections of the concessions in Afghanistan and Iran down to the Gulf of Oman, possibly to the port of Chabbar.

The first alternative is worthy of thought. It would eventually lead the oil to tidewater just below Abadan, at the head of the Persian Gulf, provided it were not run through the refinery at Abadan. If it were delivered to a tanker at Abadan, the run on down the Persian Gulf to Bahrein Petroleum Company's (The Texas Company and Standard Oil Company) refinery on Bahrein Island would not be a long one, and it is understood that controlling interests of the Bahrein Island refinery would not be averse to receiving additional production.

Further in consideration of the possibility of an alliance between Anglo-Iranian Oil Company and the Seaboard subsidiaries, it has been pointed out in certain circles that the seeming luke-warmness of efforts put forth by the former, (which had, up to the granting of the Iranian concession to Amiranian, held practically a monopoly on potentially productive lands in Iran) to keep the Seaboard group out of Iran is intriguing in that it may have indicated or presaged more than a year ago some sort of a co-operative plan. This, of course, is speculation.

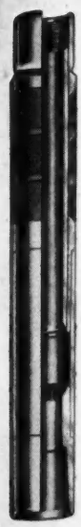
The second alternative, delivering the production to Russia on the Caspian shore, has not been given serious thought, although it could be routed to world markets that way, assuming, of course, a willingness on the part of the Soviets to become agreeable to such a plan. This alternative, however, appears highly unlikely and improbable.

The third alternative, that of building a pipe line, or pipe lines from the two concessions to the Gulf of Oman has possibilities of involving later on the greatest pipe line project the world has ever known. It is impossible to give exact mileages, for the points at which production will be developed, if it ever is, are unknown at this time, as is the route of the line. But the line possibly will exceed in length that of Iraq Pipe Line Company which carries 80,000 barrels per day from Iraq to Haifa and Tripoli on the Mediterranean Sea. Construction of such a line, assuming ability to establish production around Nefte Dja, would call for going over the Elburz mountains, with the lowest pass available in excess of 7200 feet in altitude. (Nefte Dja, it will be remembered, is on a coastal plain.) And the approach to that pass from the Gurgan plain is exceedingly steep. By going east from Nefte Dja and following the path of the Gurgan river, another pass, with an elevation of about 3600 feet would be available for the line. But the latter route would mean that the line would have to be carried along the valley of the Atrek river to Meched, or practically 300 miles out of the way, provided production were not established in the second "bright" spot which has resulted from preliminary work. From either point down to the Gulf of Oman at the northwestern tip of the Arabian Sea several more mountain ranges would have to be crossed and it is estimated at least a thousand miles of pipe would be needed.

The second "bright" spot in northern Iran for Amiranian Oil Company, or area B, as indicated on the accompanying map, is in the extreme northeastern tip of Iran, the southern tip of the western end of the general area lying about 50 miles north of extreme northwestern tip of Afghanistan, but in Iran. The northwestern part of spot B touches at Lutfabad and Dushak the railroad running from Krasnovodsk, in Russia and on the Caspian coast, to Merv in Transcaspian Turkestan, and thence east into Chinese Turkestan. Like pros-

Geologists at Gurgan Camp in Northeastern Iran. Left to right: Seymour, Interpreter Atshar, Dr. Clapp, Thompson, Hotchkiss and G. Clapp.

ROSS



• Bottom Hole Packer commonly used to pack-off above perforated liner.

• Autolock Safety Joint provides positive emergency release of fishing string.

BAASH-ROSS TOOLS
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In design, construction and operation Baash-Ross oil tools are kept thoroughly up-to-date by continuous engineering research and observation during use in the field. Parts subject to strain in operation are constructed with an ample safety factor, and wearing parts are easily replaced when required. Their dependability is demonstrated daily in every active oil field at home and abroad.

The cutting and fishing tools shown here are available in the United States on a rental basis, operated by experienced Baash-Ross service men. These tools are sold for export, and each shipment is accompanied by complete instructions for the proper operation and care of the tools. Thus, operators everywhere are assured of full satisfaction in their use.

• Packing Casing Bowl effects tight connection of casing strings in repair work.

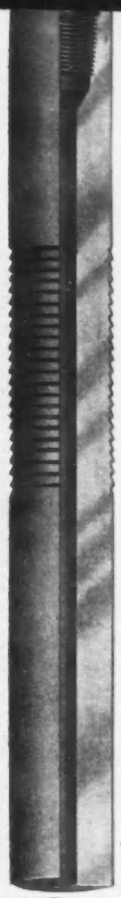
• Packing Liner Hanger suspends liner and securely packs off in casing.

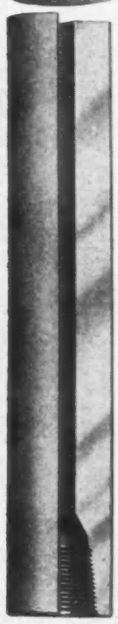
• Liner Setter (left) insures safety in setting and subsequent pulling of liners.

BAASH-ROSS
ROLLER KELLY BUSHING

• Roller Kelly Bushing Complete (Regular Body).

Here is the roller kelly bushing that provides maximum driving surface with minimum friction. Allows the kelly to pass through the rotary freely while rotating at any speed, positively eliminating the tendency to bind. Use the Baash-Ross Roller Kelly Bushing to insure economy and safety for these reasons: The entire weight of the drilling string is not suddenly thrown on the rotary table and bearings, thus preventing severe strains on the gears and rotary drive; sudden stresses are not thrown on the wire lines by the kelly passing through the table in jerks; the danger of twist-off due to the drilling string dropping suddenly and allowing the bit to "dig in" to the formation is greatly reduced; more accurate, sensitive control of pressure on the bit is made possible; and the life of the kelly itself is greatly prolonged.





• Trubore Drill Collar, above. Widest range of styles, diameters and lengths.

• Trubore Forged Upset Kell Accurately forged to true al

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pect A, prospect B is flanked on the south by mountains, the Turkoman range constituting the barrier in the latter case.

Development of prospect B would entail considerable road building, as vehicles could not be used for much of the preliminary geological work.

More than a half dozen folds are said to have been found on prospect B, but sub-surface conditions seem such, it is also said, that prospects of Tertiary production are blanked out south of the Russian border in this vicinity. Assuming reports of this condition correct, Mesozoic may be the objective of the early wildcats on prospect B. The younger rocks are said to be absent, the older ones, too deep. However, rumor comes through that Tertiary sediments may exist in an area at the eastern tip of the prospect near Daulatabad which was being worked in detail by one of the geological crews at the latter part of 1937. It is a country of rapidly rising or dropping contours, a condition which might be conducive to steep-flanked structures, and in this connection it has been pointed out that coming south from Khiva, in Khiva, Russia, normal anticlines play out just about as the Russian border is reached.

Again, looking at the enterprise from these angles, the herculean nature of the undertaking, as well as the possibilities for either herculean accomplishment in the contribution of new crude reserves to the world, or herculean failure in the event the structures found prove barren, impress themselves upon the industry.

While much work remains to be done before it can be said what definitely constitute Inland's better shots in Afghanistan (a year is much too short a time to even do a half-way job at preliminary mapping et cetera when 240,000 square miles must be covered) the northern part of the country seems to offer the best chances. Part of this area may be a continuation of prospect B in Iran; it may not. Work has not progressed sufficiently far to answer the question.

Surface indications are a little better on the spots being worked along the northern border of Afghanistan. There are several seepages in the area east of Margir-i-Sharif, and there is at least one known seepage west of the same place. As is the case with prospective areas of the Amiranian in northeast Iran, the prospective areas in northern Afghanistan are abutted on the south by a range of mountains. To the north lie plains and Russia. The proposition of getting Afghanistan oil to world markets, assuming it is produced, would be equally as difficult of solution as that presented by areas A and B in Iran. It is assumed, however, that a pipe line route to the Gulf of Omar at Chahbar would roughly parallel the sixtieth meridian, taking advantage of favorable contours all the way down. Chahbar is about 375 miles west of Karachi, India, and about 600 miles east of Bahrein in the Persian Gulf. It is some 65 miles west of the eastern tip of Iran's southern shoreline. Afghanistan, an inland country, has no coast line.

Stockholders of Inland Exploration Company and Amiranian Oil Company are Seaboard Oil Company of Delaware, Case, Pomeroy & Company, the Ogden L. Mills estate, Frederick G. Clapp, and John M. Lovejoy. Through ownership of 30 percent interest in Seaboard Oil Company, The Texas Corporation, already having attractive production interests in the East, is also concerned with the two organizations' progress.

Dr. Clapp has had the present ventures under consideration for several years. Early in 1934 he and Charles C. Hart, formerly American minister to Iran and Albania, went to start negotiations with the Iranian government, but these were later suspended.

Later, at the request of the Afghan government, Hart went to Kabul and started discussing the matter of developing production in that country. This was late in 1935. Clapp joined him in the spring of 1936, and negotiations were carried on in the face of what has been described as intensive competition.

The competition apparently was handled with success, for on November 19, 1936, an oil concession in favor of Inland Exploration Company was signed, with Faiz Mohammed Khan, foreign minister, acting as principal government representative and signator. Other persons who participated on the Afghan side of the agreement were Mriza Mohammed Khan, minister of trade, and Abdur Mehjid Khan, president of the Afghan National Bank.

Upon conclusion of the Afghan negotiations, Clapp and Hart returned to Iran to resume negotiations with the government, which was represented by the late Mirza Ali Akbar Davar, minister of finance who acted with the advice and consent of inner government circles on all important points.

These negotiations lasted throughout the year, but on January 3, 1937, a concession in favor of Amiranian Oil Company was signed by Mirza Mahmud Djam, prime minister and finance minister representing Iran, and Clapp and Hart, representing the company.

At the same time, Iranian Pipe Line Company, sponsored by Amiranian Oil Company, received the right to build a pipe line to any mutually satisfastory point on tidewater for transporting both Iranian and Afghan oil.

In this connection, the company has officially announced: "It is contemplated that a port and refineries ultimately will be constructed at some point on the coast to be selected by the company's engineers." Clapp recently took a trip down to the southeastern tip of Iran to attend to pipe line matters, which is just another one of several incidents leading one to believe that the two companies may have far greater faith in the Afghan and Iranian concessions than the outsiders have been able to build up from the meagre details which have been divulged. On the other hand, Clapp's recent trip may have been mere routine.

Inland Exploration Company within a specified period must select five provinces out of all of Afghanistan, which the concession covers, and then will be allowed to produce in these 5 provinces for 60 years, the life of the concession.

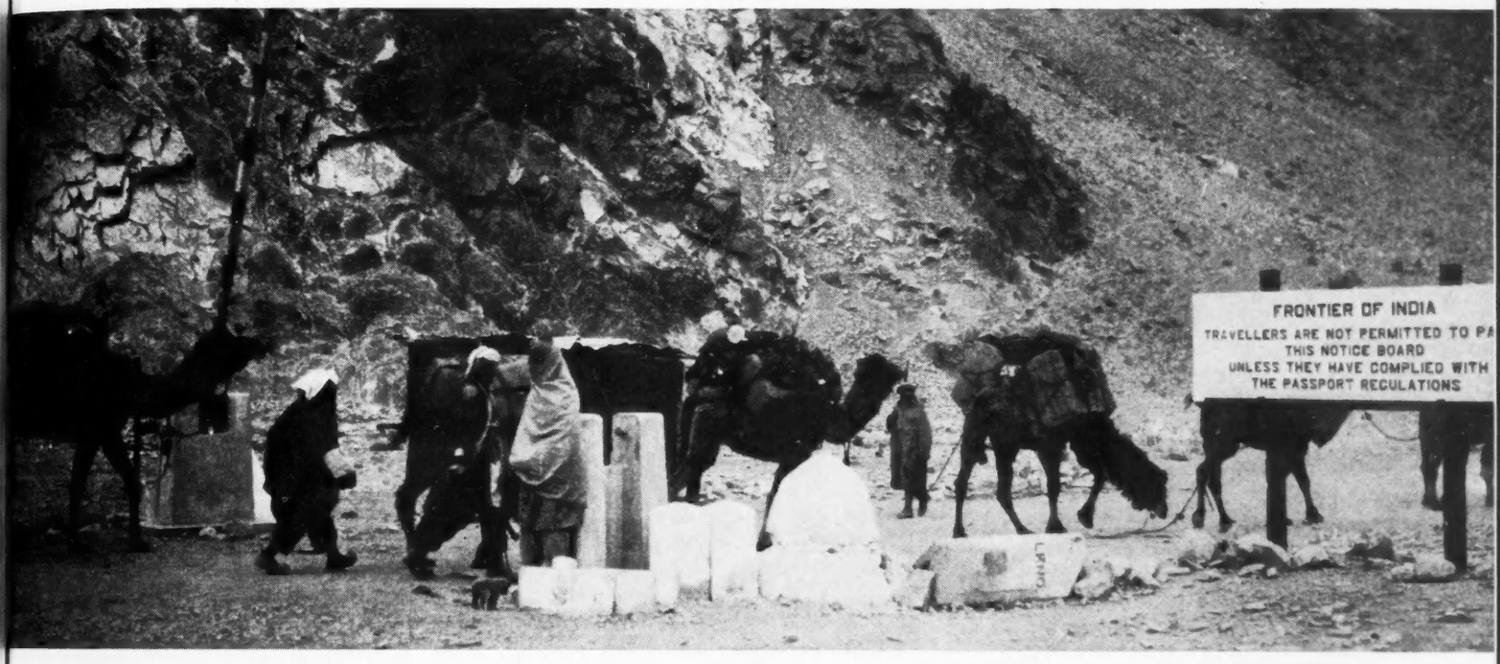
While the time allowed to select the 5 provinces in Afghanistan has not been made public, it is considered to be a little more lenient than that allowed by the Iranian concession. Hence the Afghans will benefit from more thorough geologizing before the first location is spotted. Of the 190,000 square miles comprising the concession granted Amiranian in eastern Iran (it consists of practically all of Iran not held by Anglo Persian Oil Company) the company must select 100,000 square miles of territory in which to attempt to develop production by drilling.

It is known, however, that drilling on both must be started in less than two years.

The first geological parties left New York bound for Afghanistan August 5. They first went to Karachi, India. Then they proceeded by train to Pashawar, and then motored through the historic Khyber Pass and Hindu Kush mountains on into northern Afghanistan. Since then additional men have been sent east from the United States.

AFGHANISTAN TRANSPORTATION IS PRIMITIVE

Caravan at the entrance to Khyber Pass, mountainous gateway from India into Afghanistan, defense of which has cost many lives.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TRAVELLERS ARE NOT PERMITTED TO PA
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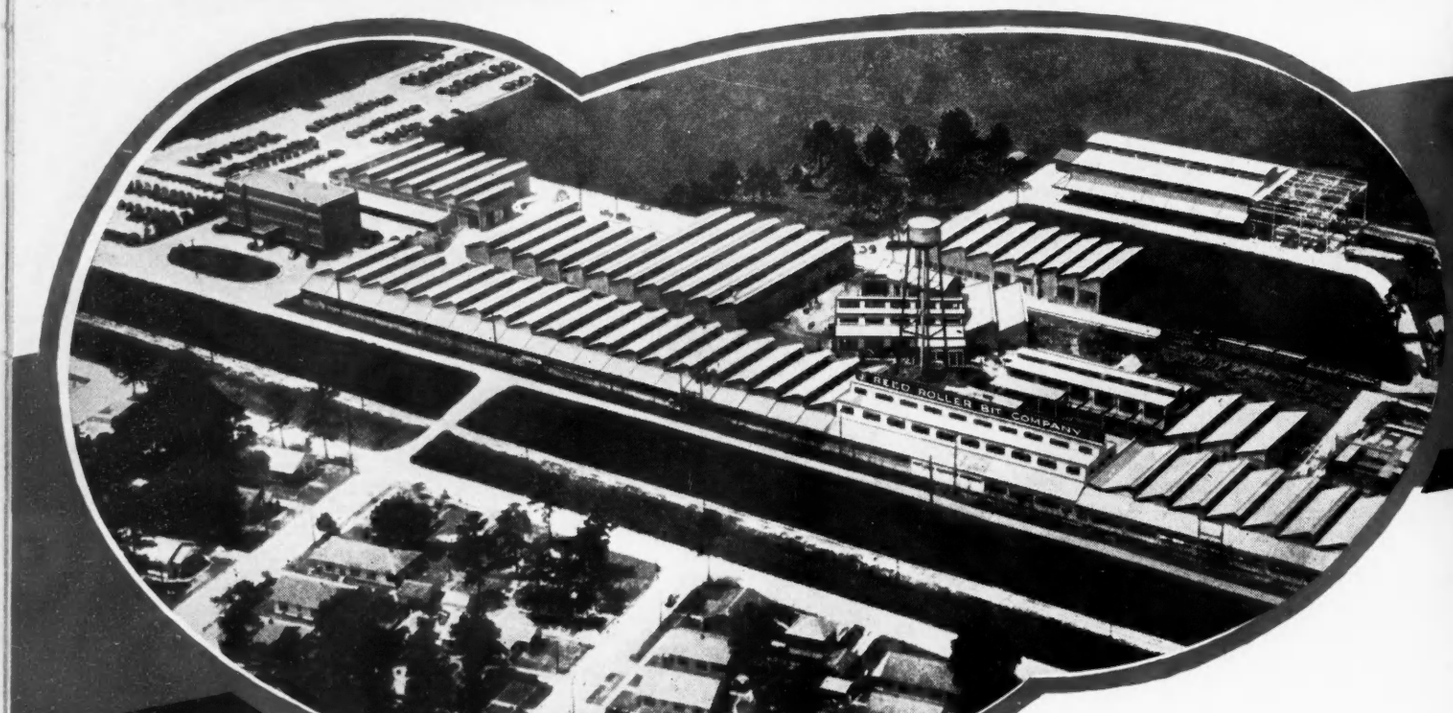
UNLESS THEY HAVE COMPLIED WITH
THE PASSPORT REGULATIONS

Afghanistan is still a land where frontiers must be carefully watched. Many parts of the country have never seen automotive equipment and the camel is the principal transportation.

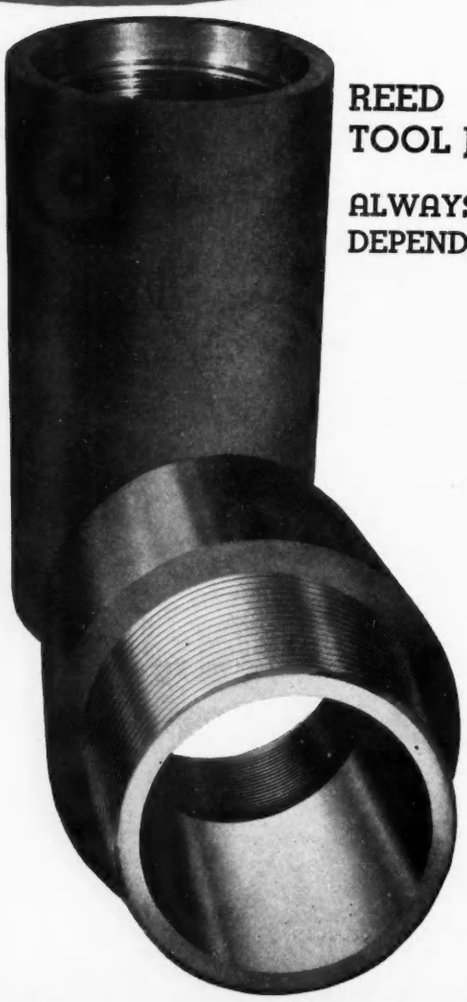
Ferry on the Kunduz river, not far from where it joins the Oxus, a large stream running out of Russia into Northern Afghanistan.

..REED ROTARY



REED DK ROCK BITS

FOR MORE HOLE PER BIT AND FASTER HOLE WITH GREATER SAFETY



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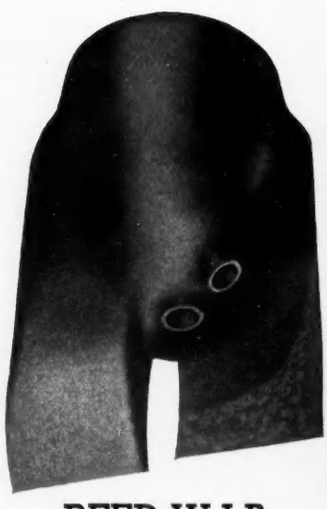
ALWAYS
DEPENDABLE



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DRILLING BITS

FOR FASTER CUTTING SPEEDS AND MORE TIME ON BOTTOM

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In order to develop the highest quality of forgings from carefully selected alloy steel blooms and billets, specially designed furnaces are maintained where the heating is under accurate control. Forge men in the Reed shops have long specialized experience.

METALLURGICAL CONTROL

The metallurgical laboratories of the Reed Roller Bit Company are manned by expert scientists who keep constant control over the condition and quality of all Reed Products, from the raw steel, through manufacture to completion.

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North Europe

Paleozoic formations in this area are to be tested, which will call for deep drilling

IN Northwestern Europe explorations are being made, on the suggestion of W. A. J. M. van Waterschoot van der Gracht, on the theory that it is possible that petroleum occurs in the Paleozoic of this region, provided it can be reached at a sufficient distance from the sharply folded mountains, which have been formed in the late-Pennsylvanian (the Variscides), to which belong the Ardennes, the Eifel and the Rheinische Schiefergebirge. Indications exist that equally as in North America under such conditions petroleum is present. Over most of the area, however, the Paleozoic is far too deeply buried to make explorations possible. Even now wells will have to be drilled to 8,000-12,000 feet.

Explorations of this kind now are being made in England by D'Arcy Exploration Company, a subsidiary of Anglo-Iranian Oil Company.

In the Netherlands, Royal Dutch Petroleum Company is planning explorations in the Provinces of Gelderland and Overyssel, for which it received a government license. For the time being these operations confine themselves to geophysical work and shallow test wells to check the geophysical data.

In Westphalia, Germany, six deep test wells are drilling for oil now. The locations are: near Drennsteinfurt, Ascheberg, Hiltrup, Oelde, Senden and Seppenrade. All these locations are considerably north of the belt which is being worked for coal. Here the Carboniferous occurs at depths from 3000 to 4500 feet, under a covering of upper-Cretaceous. Four of these wells are now drilling in the Carboniferous, at depths of 4000 to 5000 feet; 2 are still in the Cretaceous. The rigs will go as deep as present technique permits, 12,000 feet and over. All locations are on favorable structure, ascertained by geophysical methods.

Promising showings of oil and great quantities of wet gas have so far been obtained in three of these wells, but they have not yet reached the horizons where commercial oil seems probable. Porosity so far is disappointing, but is expected to improve.

Drilling is done by powerful independent interests, under the leadership of F. J. Vingerhoets of Brussels Belgium.

New German Field

Despite the increasing amount of crude oil produced in Germany during the last five years, domestic consumption still greatly exceeds present production. However, considerable efforts towards the finding of new oil pools are being made, and success in this direction has been gratifying.

One of the latest oil pools, which may eventually be of great importance, has been discovered in Allermoehe-Reitbrook, near Hamburg. Late in December the second well in that area was brought in, and proved a prolific producer. The initial flow in the first 24 hours was estimated at 100 metric tons. Although the most modern machinery and safety devices were used, the well blew out. Efforts to conserve the oil were successful, when workmen constructed levees around the well. To prevent the well from catching fire every precaution was taken. The latest fire fighting equipment was ordered immediately from Hamburg and several hours later men and equipment were available to stand by in case of necessity. Due to the escaping gas, possibilities of igniting existed, and for this reason occupants of the surrounding houses were ordered to extinguish open fires and use electrical appliances for heating and cooking purposes. As a further precaution, all roads leading to or closely passing by this new well were closed which made it impossible for others than officials to get close to the producer.

At the time when the well was running wild, preparations were made to lay pipes, to transfer the oil from the levees to storage tanks located nearby. Production of this new well was secured from a depth of about 2050 feet, and from all indications the oil should prove to be of average quality.

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This new casing is made from alloy steel, a special analysis developed for combination with heat-treating to produce increased strength with uniform ductility.

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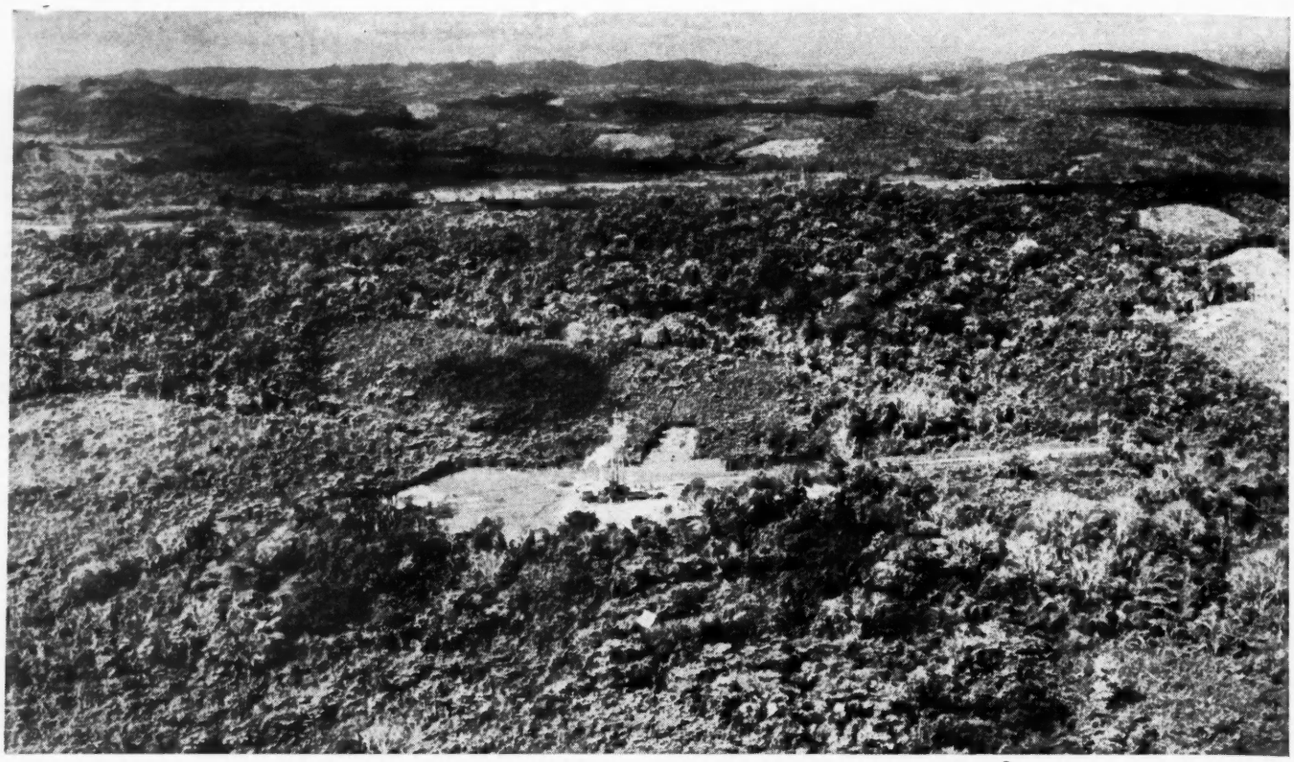
HEAT-TREATED CASING



General aerial view of the Poza Rica field, with a drilling well in center foreground

Poza Rica

Mexico's greatest single crude reserve, expected to ultimately yield over 500,000,000 barrels, is being scientifically developed and operated

STEADY and systematic development of the prolific Poza Rica field undoubtedly will follow recent agreements reached by the principal operating company and the Mexican government. The limited drilling in the field during the past two years has been occasioned by various uncertainties that seriously retarded normal operations. Closer cooperation between Compania Mexicana de Petroleo "El Aguila," the largest leaseholder, and the Mexican government probably will accelerate drilling activity and all other field operations that normally parallel or follow actual completion of oil wells. El Aguila already has extensive plans for road construction, camp improvements, and production refinements that can be consummated only in the event of various assurances that will permit continuous field operations.

A Major Field

Poza Rica, one of the newer producing areas along the Mexican coast, represents a major oil and gas reserve that can do much to restore the country's lost prestige in the petroleum realm. The systematic drilling program planned

by El Aguila and the Mexican government probably will provide a future oil production that will care for a large part of the country's petroleum requirements. Already the most consistent producing area in Mexico, the field simply awaits a full development that will bring it to its best potential strength.

Discovery of the Poza Rica field in 1930 followed a period of many years' active exploration by the Aguila company (Mexican Eagle) in a large district south of the Tuxpam River, through which general area a southern geographical prolongation of the famous "Golden Lane" would run. Discovery of the field stands as a tribute to patience and skill in an isolated district. The field is located in the state of Vera Cruz, about 130 miles south and slightly east of Tampico, and about 40 miles south of Tuxpam. The location is about 35 miles south and east of the last major link in the "Golden Lane" Chain, Alamo-Paso Real-San Isidro.

The general idea initiated a long and costly search for new fields, which, in the face of continual disappointments, was kept alive by the discovery of a small field at Mecatepec in 1928, and by early geophysical indications of large deep-seated structures which were correctly assumed as possibly involving the Cretaceous limestone, elsewhere richly productive.

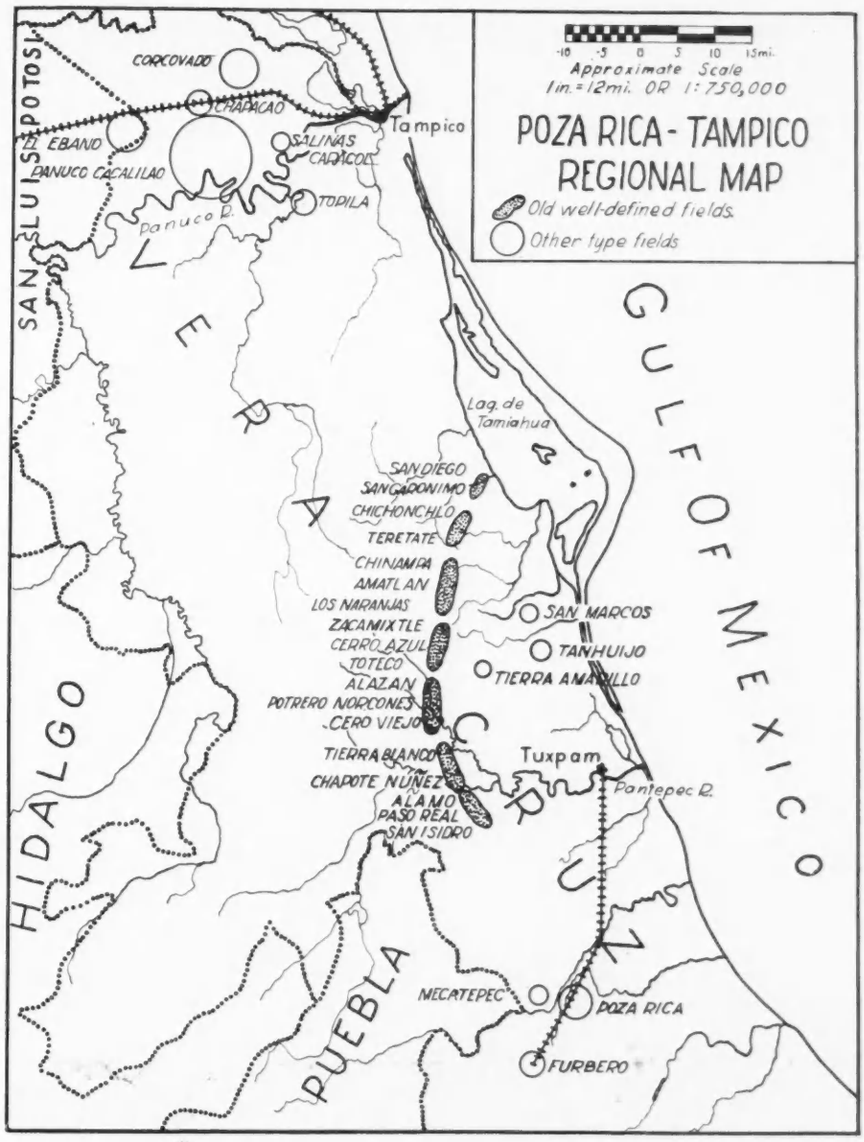
The first and second locations at Poza Rica were based upon such indications, but the first location was never drilled for various reasons. Well No. 2 was spudded in July, 1926, but drilling was suspended about 3½ months later.

In 1928 the Mecatepec discovery was made and, although later failing to live up to its initial promise, it was largely responsible for a maintenance of exploration interest in the area, and the renewal of deepening operations in Poza Rica No. 2, only six kilometres away. However, the producing formation of Mecatepec proved to be undeveloped in Poza Rica No. 2, and the well became a rather forlorn deepening hope until geological evidence indicated the possibility of the Cretaceous limestone being within reach of the drill.

The potentiality of the limestone was amply indicated by the completion in June, 1930, of Poza Rica No. 2, which had an initial production of 1,500,000 cubic feet of wet gas and about 20 barrels of condensate daily. Mechanical difficulties prevented further deepening of the well, and the real importance of the field was not established until the completion of Poza Rica No. 3 in June, 1932. This well produced 2000 barrels of oil daily, and production has since been increased to 5000 barrels daily by a workover based upon information obtained from later wells. The first bona fide completion vindicated the early belief of geologists and geophysicists that oil production would be developed in the area.

Since the completion of Well No. 3, 14 wells have been placed on production by the Aguila over an area approximately nine kilometres long and three kilometres wide, and the total recoverable reserves of the field are conservatively estimated at 500,000,000 barrels. Present daily production of

By BRAD MILLS
Associate Editor



The Poza Rica field is about 35 miles south and east of of the last major link in the old "Golden Lane" chain.

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Truck equipped with Thornton four-wheel drive, Braden power winch, and Hercules split shaft power take-off for heavy oil field duty. Shown on truck is Wilson Mogul well servicing machine, the most modern of well servicing units

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the field is about 70,000 barrels of crude oil and 1000 barrels of absorption gasoline. The total recovery to the end of 1937 amounted to about 47,000,000 barrels. The accompanying curve shows the average daily production during the past five years.

Scientifically Exploited

The actual attainment of this high production figure, in practice, has been dependent upon scientifically controlled exploitation. Drilling development and well completion and production methods will be designed to utilize efficiently the available water-drive and gas-cap energy, in an effort to avoid the possibility of a recurrence of the experience in other Mexican limestone fields, where indiscriminate drilling and production practices have led to the complete loss of large volumes of originally recoverable oil, and the greatly delayed and expensive recovery of much of the remainder.

In Poza Rica, the rational unit development arrangement made with the Mexican government indicates that the parties interested in the exploitation of the field are fully aware of the dangers and possibilities of uncontrolled development. Given reasonably settled conditions, the prospect for the field appears very bright.

Steady development of the Poza Rica field depends to a great extent upon settlement of labor troubles, which the Aguila, in common with all other companies in Mexico, has been experiencing. A satisfactory solution of the problem will virtually guarantee the orderly exploitation of the Poza Rica field.

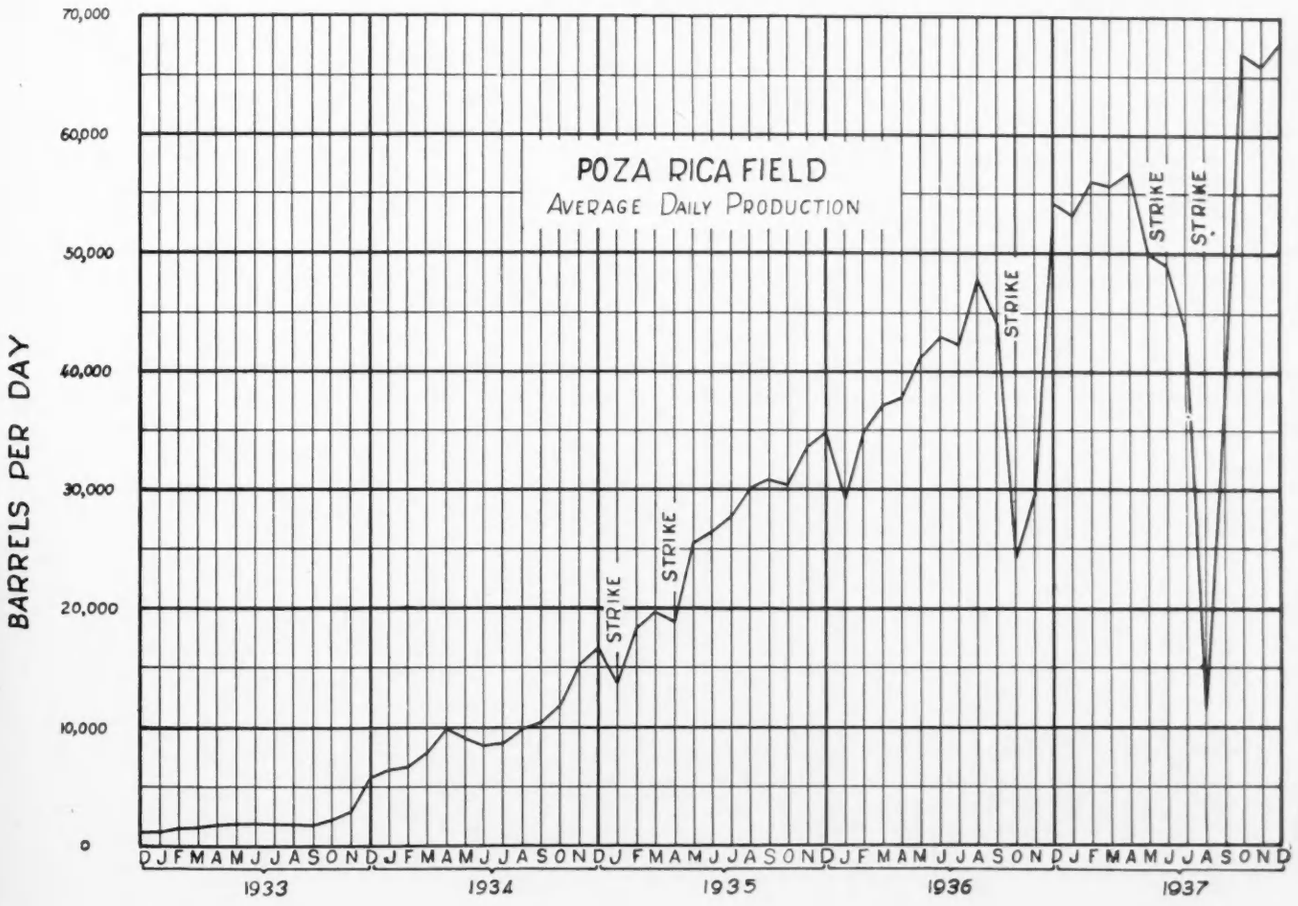
Drilling results have in a general sense confirmed the existence of a broad, deep-seated uplift with oil accumulation in porous Cretaceous limestone. Production is obtained from this porous limestone at depths ranging from 7000 to 7500 feet, and there is definite evidence of gas-cap and water-drive conditions. The original formation pressure was about 3200 pounds per square inch. Production of the 47,000,000 barrels of oil has been accomplished with only a negligible loss in formation pressure. The wells have been so widely spaced that the drainage area of one interferes very little with another. The future drilling program calls for well spacing that will give full utilization of the field's natural forces.

The crude petroleum has a specific gravity of about 0.870 (31° A.P.I.) and is paraffinous. It is a typically Mexican crude oil, but is of a somewhat better grade than that produced from the very shallow fields.

Two dry holes (Mecatepec No. 7 and Poza Rica No. 8) have proved the absence of porosity in the east and south direction from the discovery well, and a 250-barrel produced (Poza Rica No. 19) to the southeast appears to be close to the limit of the field in that direction. One well (Poza Rica No. 10) definitely drilled into high-pressure salt water (bottom-edgewater) to the north, but later was repaired after a difficult and lengthy plug-back job.

Other wells have given evidence of strong salt water underlying the oil, so that the completion and

The production trend at Poza Rica has been steadily upward, except during periods of labor trouble. It is believed that the daily output of the field will increase gradually as new wells are completed.


POZA RICA FIELD
AVERAGE DAILY PRODUCTION
BARRELS PER DAY
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
STRIKE
STRIKE
STRIKE
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D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1933
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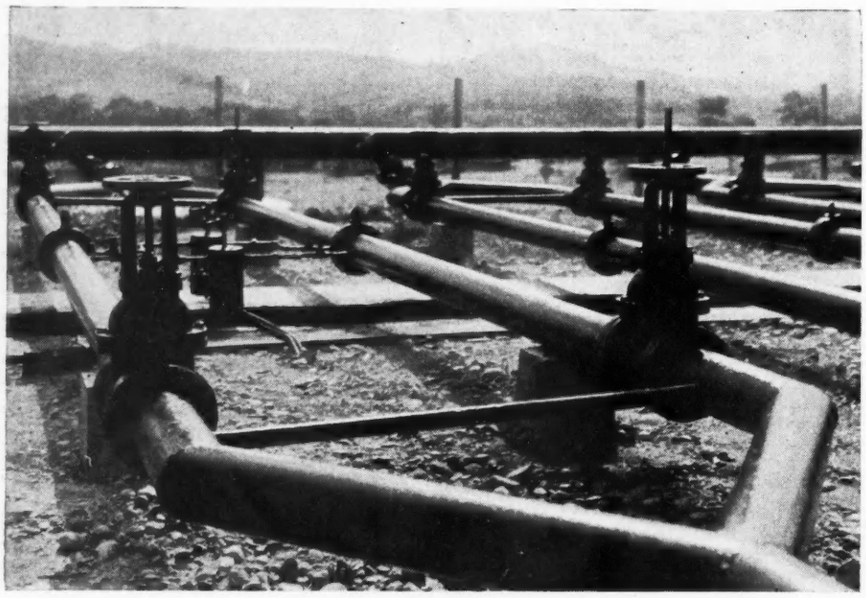
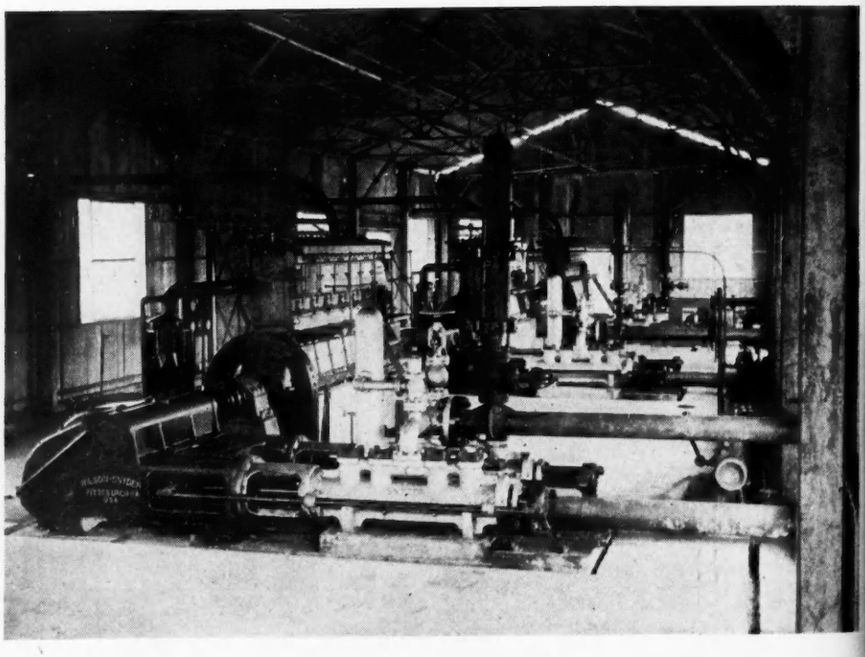


Details of 6-inch pipe work installed for oil metering. Note water seal pots in center connected to both orifice connections on either side of the "Y."

production of all wells must be supervised carefully. This precaution applies to water encroachment and gas conservation, and the work is carried on by engineers experienced in this type of production in other parts of the world.

During the past five years the production program for the Poza Rica field has been greatly influenced by the capacity of the pipe lines from the area. The 6-inch line connecting Poza Rica with Tuxpam Bar and Palma Sola and thence to Mexico City was the only outlet until March, 1934. At that time an 8-inch pipe line was laid between Tuxpam and Poza Rica (63 kilometres) and an extension made of the intermediate pump station at Kilometre 32. However, due to the necessity for pumping different types of crude both ways over a long section of the line, the actual outlet from Poza Rica was restricted to approximately 32,000 barrels daily until late in 1935. From that date until completion of a new 12-inch line between Poza Rica and Tuxpam Bar during the first part of 1937, the maximum outlet was around 45,000 barrels daily. This new 12-inch line brought the total pipe line capacity from the field to 100,000 barrels daily to Tuxpam Bar, in addition to 15,000 barrels daily to Mexico City.

Development during the past year has been considerably retarded in both drilling and pipe line construction, because of difficulty in obtaining the requisite government permits, and by a prolonged labor strike. It is believed, however, that the agreement recently concluded between the Aguila and the Mexican government for the joint development of the field will considerably accelerate development of the area. The agreement is based upon an orderly development program that calls for a well-spacing of 750 metres. At the moment, Aguila drilling operations are severely curtailed, and considerable new pipe-line construction is suspended, pending settlement of labor demands in connection



Diesel pump station erected 1937 on 12-inch line from Poza Rica and Tuxpam.

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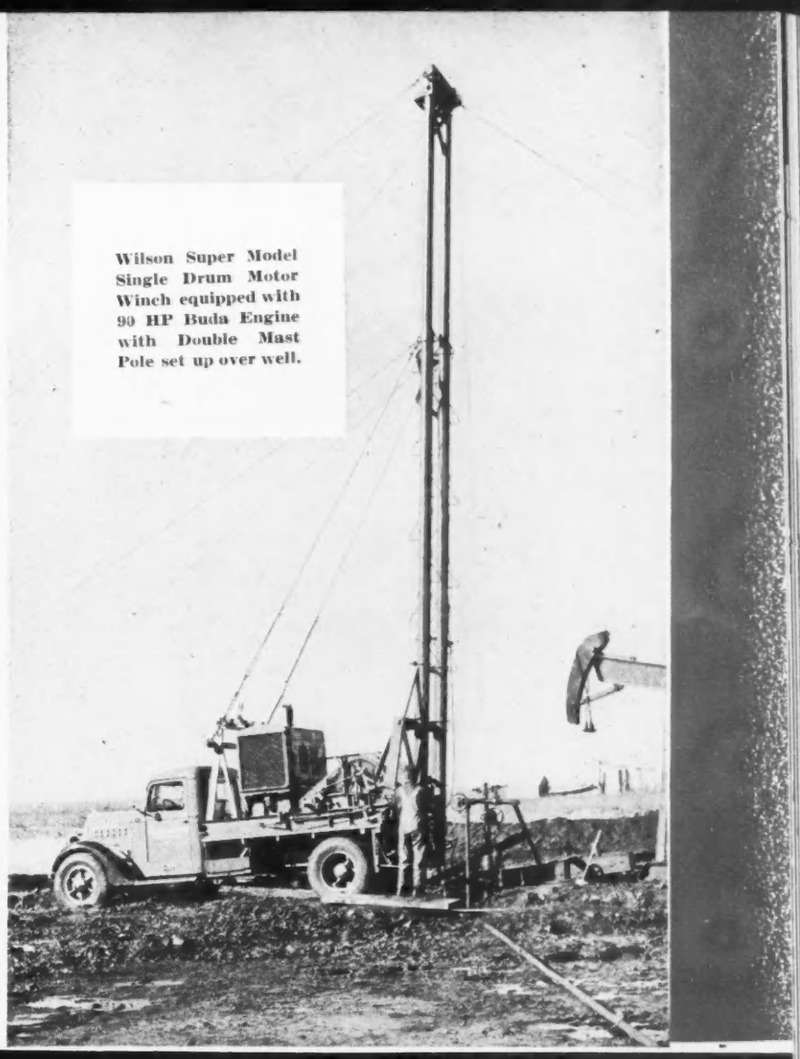

Wilson Super Model Single Drum Motor Winch equipped with 90 HP Buda Engine with Double Mast Pole set up over well.

Wilson *Telescoping* Double MAST-POLE

Wilson Super Model Double Drum Motor Winch with Buda 90 HP Motor; with Double Mast Pole and Guy Wires Attached — Moving to New Location.

The Super Model Wilson Winch, equipped with a 90 HP Buda, is the suitable size winch for use in connection with the new Wilson Double Telescopic Mast-Pole.

The Super Winch has a drum with 32" diameter drum flanges and 8" wide brakes, equipped with Timken Roller Bearings and has a capacity of 4,500 ft. of ¾" or 6,500 ft. of ⅝" wire line. A sand line drum having a capacity of 6,500 ft. of 9/16" wire line can be furnished if desired. (See illustration above.)

All controls are located at right front corner of the machine so that operator may have complete control of all lines and in case of emergency, give static helpers.

★ **Here is the answer to a long existing need —the Wilson Telescopic Double Mast-Pole. Rigid tests and actual use in the field have proved that this new Double Mast-Pole will service wells from 4,000 ft. to 4,500 ft. equipped with 2½-inch A.P.I. tubing, with unusual efficiency and complete safety.**

Only 15 to 20 minutes is required to raise the Mast-Pole over a well and begin operations. The pole, which is made of 6⅝-inch and 5-3/16-inch seamless pipe and is 50 feet high when extended to full height, can be mounted on practically any type or size of Wilson Winch now in use or on any new Wilson Winch.

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The Poza Rica field is located in a wooded, tropical area in Vera Cruz state. Well locations usually involve heavy expenditures and a great deal of preliminary work.

with a new collective contract.

Aguila has under consideration the construction of a 12-inch pipe line from Tuxpam Bar to Tampico, a distance of about 200 kilometres, but no decision on the project can be made in the face of existing uncertainties.

The Palma Sola-Mexico City pipe line was an interesting engineering achievement in several respects. It was completed in early 1932 and is about 224 kilometres in length. The line traverses almost every possible type of terrain and is of welded construction. The maximum capacity is 15,000 barrels daily, and the line is the chief source of supply for Mexico City and the surrounding country. The elevation at the Palma Sola station is about 200 feet, but the pipe line at the highest point reaches an elevation of about 8250 feet. Pump stations are required at frequent intervals along the line, chiefly between the flat country on the east side and the summit of the mountain range near Pachuca, but the flow into Mexico City from the summit is a comparatively easy movement. The pipe line was built under adverse conditions and during an unusually severe rainy season, but was completed without serious mishap.

In Poza Rica the Government Administration completed one 3000 barrel well in 1936, and recently added two good oil producers. Three locations have been made and at present are preparing for drilling. It is believed that the government will pursue a conservative development policy on its holdings in the field.

The Poza Rica field is situated in a rather hilly, forested country, and is served by a narrow-gauge railroad owned and operated by Aguila, from a terminal and wharf on the Tuxpam River, known as Cobos and which is 57 kilometres from Poza Rica and approximately 160 kilometres by canal and lagoon transportation from Tampico. Within the field, development has been carried on to date by an extensive narrow-gauge track system, but road construction was commenced in 1937 and future development will utilize roads exclusively.

The considerable distance of the field from shipping, rail or road facilities and the hilly nature of the terrain, in conjunction with a generally wet, tropical climate and profuse vegetation, have made the installation and operation of transportation facilities a major item of expense in the exploration and development of the field.

It is almost incredible that a light, 28-inch, narrow-gauge railroad could have transported so much heavy equipment to the Poza Rica field. Boilers, engines, draw works, and machinery of every nature have been hauled from Cobos to the field. The narrow gauge railway originally was built about 1912 to serve the old Furbero field, located about 12 miles southwest of Poza Rica. Aguila acquired the small railroad when it took over other extensive holdings in the district. Light cars powered by small automotive type engines are used for passenger and express service, but heavier trains drawn by larger gasoline engines are used for various types of freight service. Small cars of several types have been designed for handling the thousand and one things that must be transported by the little railroad. The trip from Cobos to Poza Rica is more than an experience—it is an adventure.

All development in the Poza Rica field has been done with the narrow gauge railroad as the only transportation medium. Short spurs and feeders have been built to each well location, just as a highway would have been built. Although the cost of building the narrow gauge railroad is $5500 per kilometre, as compared with about $16,500 per kilometre for highway construction, Aguila recently started a highway construction program that ultimately will serve the entire field. The greater initial cost of highway construction probably will be justified by the much greater flexibility and speed of highways.

Drilling Work

The earliest wells in the Poza Rica field required six months from spudding to completion. This period has been gradually reduced by about one half, due to the following causes:

1. Modern developments in drilling equipment, particularly bits.

2. The reduction of hole diameters, consequent upon substitution of a 13⅜-inch, 9⅝-inch, 6⅝-inch, 4¾-inch casing scheme for the original 18⅝-inch, 13⅜-inch, 9⅝-inch, 6⅝-inch scheme.

3. The practical elimination of mechanical coring and the selection, after trial, of the most suitable drilling bit for each formation.

4. Improved control of drilling mud properties to meet specific conditions.

Drilling problems in the Poza Rica field are not unusually severe. The present drilling-rig set-up utilizes concrete foundations, 136-

It is almost incredible that the narrow-gauge (28-inch) railroad, shown above, could have hauled so many heavy items to the Poza Rica field. Here is a train of 12-inch pipe, oil, supplies and native Mexicans.

foot derrick, unitized draw works, fluid friction brakes, 12 x 12 horizontal twin steam engine, 14-inch or 18-inch stroke slush pumps, and 25½-inch or 27½-inch oilbath rotary machines. Standard 5-9/16-inch drill pipe with shrink-grip tool joints are favored for the greater part of the drilling, i.e., to the 6⅝-inch cementation depth.

The old-type draw work formerly used at Poza Rica has been unitized in Aguila's field shops, and the new arrangement reflects clever workmanship in every detail. The center of gravity has been lowered and the unit given a tailored appearance. The cathead has been "laid down" and placed in a strong frame in a horizontal rather than a vertical position. The controls have been simplified and pressure oiling installed as an added safety measure.

Up to the present, four 85-horsepower, 175-pound pressure boilers have been installed at each location, but improved transportation

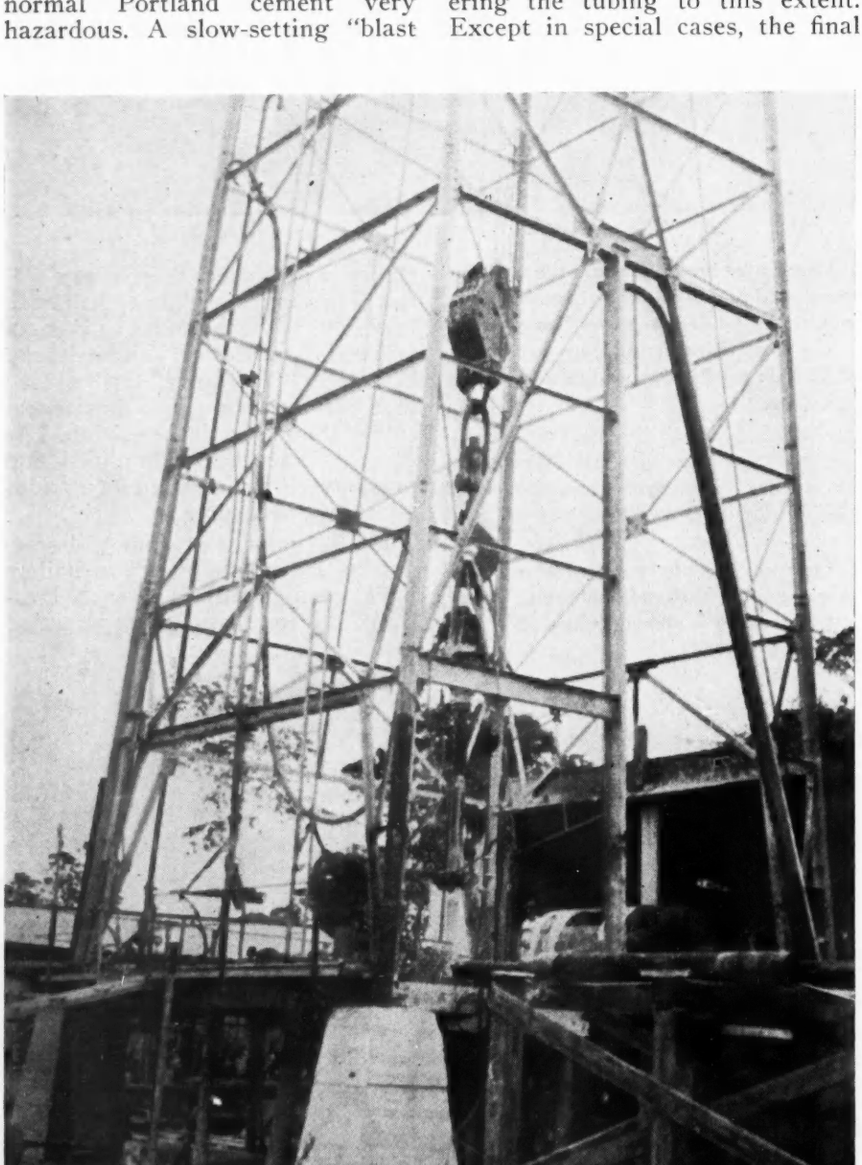
Type of passenger car run on the narrow-gauge railroad between Cobos and Poza Rica is shown below.

facilities will now make possible the use of heavier boilers with higher steam pressures.

The chief change in cementing practice during the past two years has been in the quantity and specification of the cement employed. Following the observance of gas leaks between the casing strings at the prevailing operating pressures, the quantity of cement used for each cementing operation was increased to insure cementing up to the shoe of the previous string. The high formation temperatures at the depth of cementation of water strings, gas-cap liners or plug-back jobs made the use of normal Portland cement very hazardous. A slow-setting "blast furnace" cement is now used exclusively and results have been very satisfactory.

In normal wells the final casing string consists of Grades "C" and "D," 6⅝-inch, 28-pound pipe. In wells with gas caps, a 4¾-inch liner also is cemented. Otherwise wells are completed simply with a few joints of perforated tubing (¼-inch round holes) on the bottom of the tubing string.

The tubing normally consists of 3-inch external upset, with sufficient 2½-inch plain on bottom to reach from the 6⅝-inch casing shoe to the total depth of the hole, in the event of the necessity for lowering the tubing to this extent. Except in special cases, the final landing depth of the tubing string is generally near the top of the productive limestone, and at a point sufficiently below the 6⅝-inch casing shoe to insure that the cementation will not be accidentally affected by subsequent acid treatment.



Medium weight drilling equipment has been used at Poza Rica, but heavier equipment will be installed when drilling operations increase.

Production Practices

Wells are normally flowed through both the tubing and the annular space between tubing and casing, and a simple 3-inch, all-flanged, 6000-pound test, combined tubing and casing Christmas tree is employed on a Santa Fe type casinghead and latest type master control assembly.

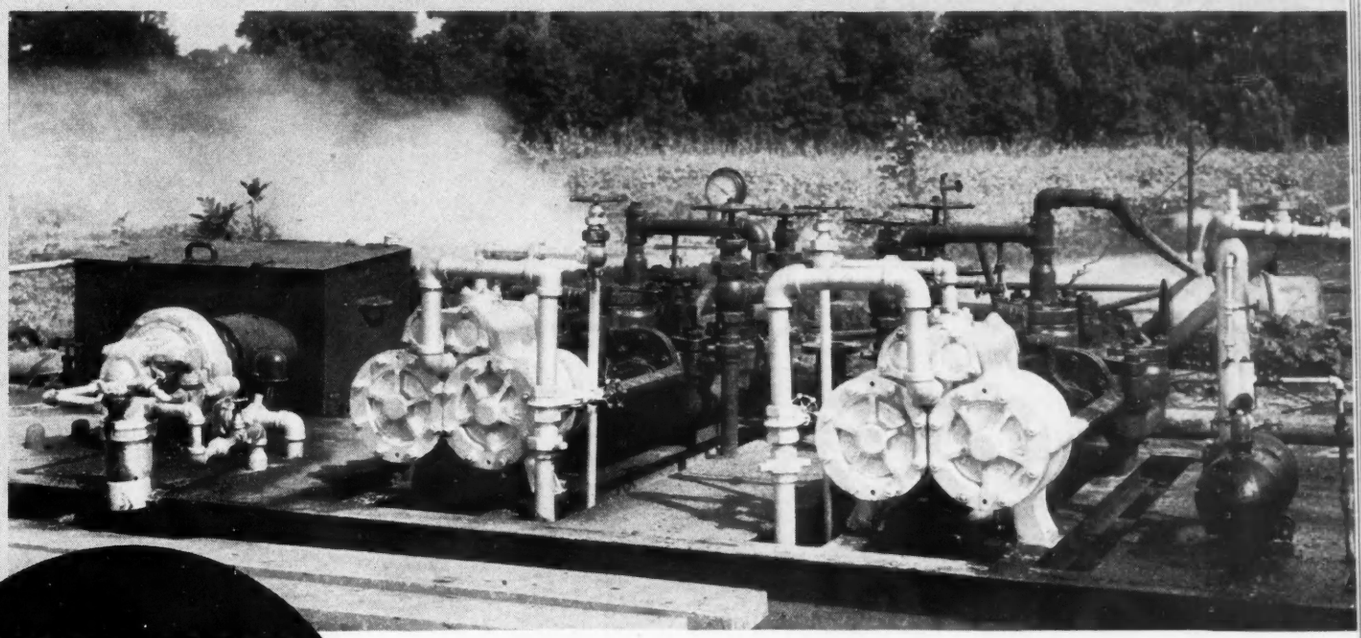
Poza Rica wells on completion are brought in by displacing the drilling mud with water, and swabbing is unnecessary to initiate flow. The wells are flowed to atmosphere for a short time through a ⅜-inch or ½-inch bean until the wash water content drops to about two percent, before they are turned into the flow line. Beaning up by five mm. stages per 24 hours is normal policy except in the case of wells with gas-cap cementations, for which a more cautious beaning-up policy is adopted. In the latter group of producers, smaller bean changes are made at longer intervals, for such wells a change of two mm. per day never being exceeded. New wells usually are opened up to determine initial maximum production capacity, and then treated by direct injection of 2500 gallons of 15 percent acid, with reversal after 1½ to 3 hours.

All Poza Rica wells have been equipped with tubing, which is considered indispensable. The safety factor is the principal consideration in the use of tubing, and killing of a well in case of emergency should not be a difficult task.

As yet, no difficulties have resulted from the practice of maintaining flow through the annular space between the tubing and casing, and in wells of insufficient capacity to maintain steady flow through both tubing and annular space, the tubing is closed in preference to the casing outlet and the wells flowed through the casing. This confines the highest pressures to the tubing, which is better able to withstand them.

The centralization of all separators

BOILER FEED PUMPS for OIL COUNTRY SERVICE



A unitized Boiler Feed assembly, with two Gardner-Denver 10 x 4½ x 10 "FS" pumps operating in the Texas Gulf-Coast district.

GARDNER-DENVER "FS" AND "FJ" (10 x 4½ x 10) (7 x 4½ x 10) HIGH PRESSURE BOILER FEED PUMPS

- **Fluid Cylinder—Valve pot type, tested hydrostatically to 2500 pounds. Short, direct suction and discharge passages giving close clearances and high efficiency.**
- **Steam Cylinder—Strongly ribbed to withstand, safely, high steam pressures. Designed for a working pressure of 400 pounds per square inch. Short and direct steam ports for decreased clearances, assuring steam economy.**
- **Steam Valves—Balanced piston type. Valves remain tight at all steam pressures and with superheat. Maintain original efficiency for long periods of operation.**

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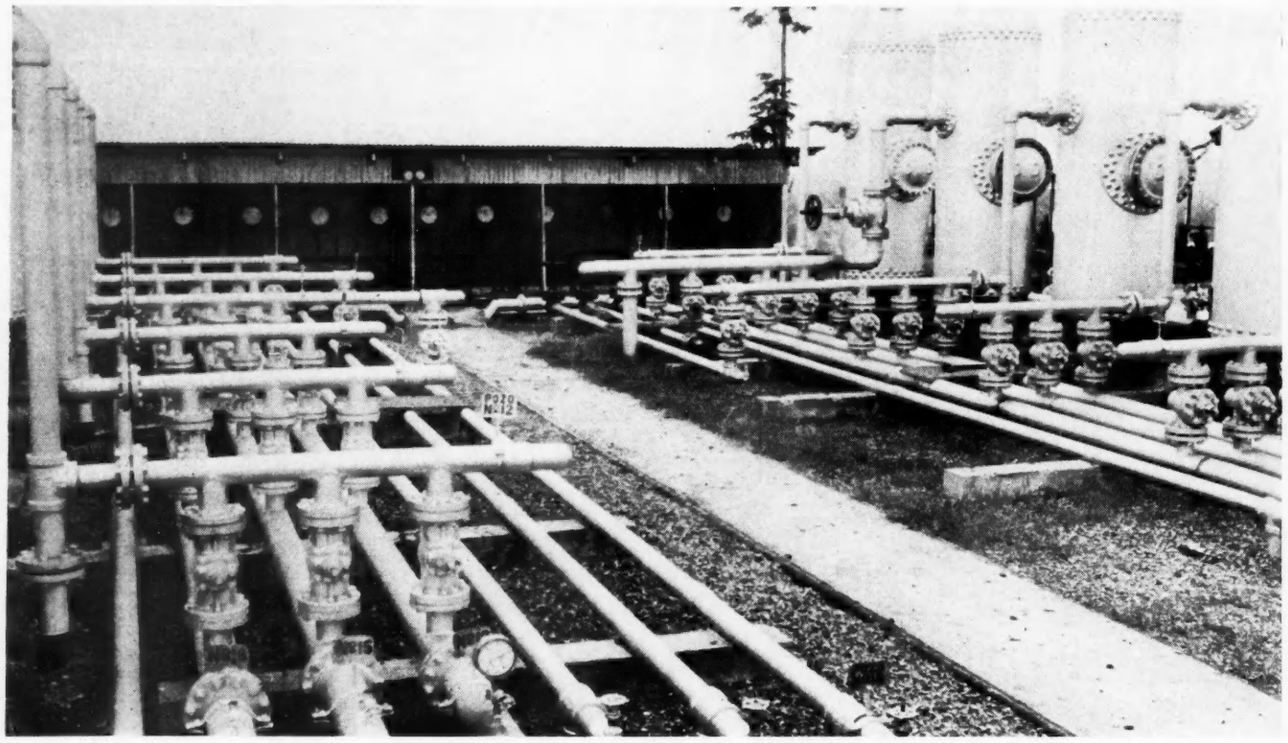
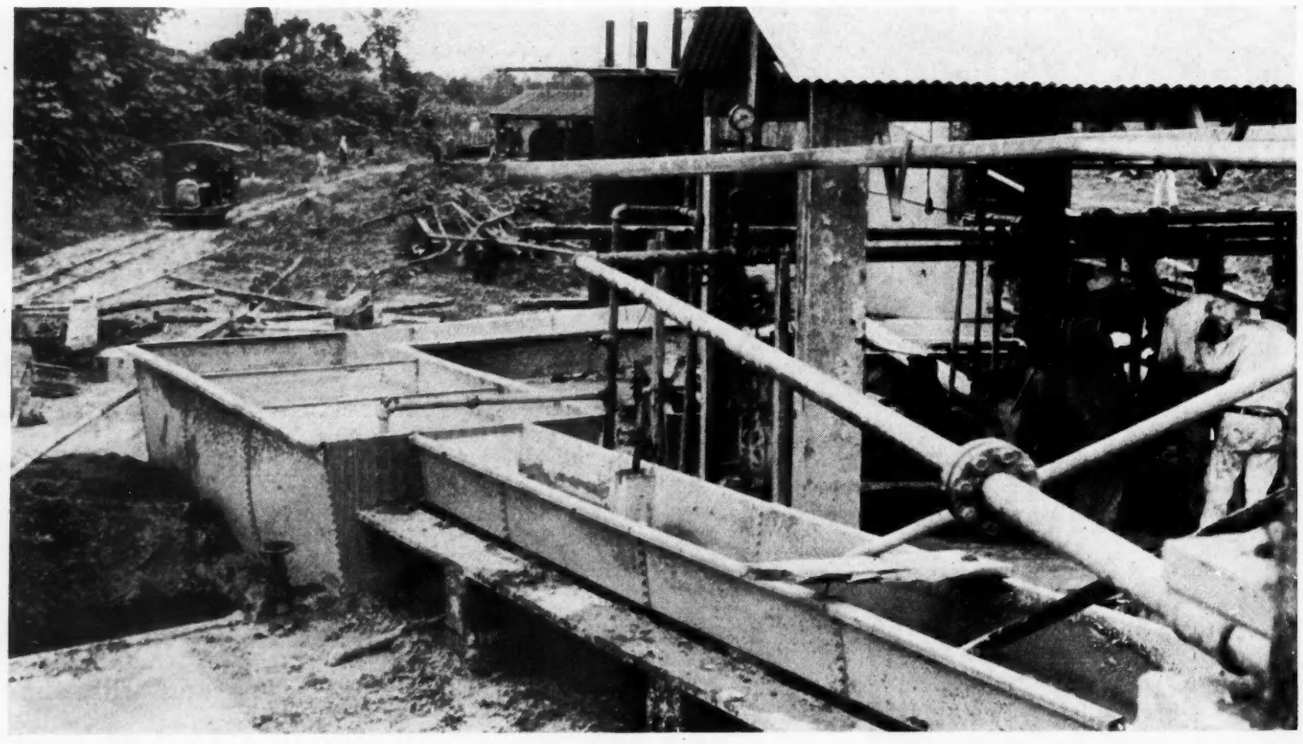


A corner of the high-pressure separator battery.

for both high and low-pressure separation in central battery stations has been adopted as the most suitable for the Poza Rica field. A plant of this type has been in operation since June, 1934, and has been extended to provide for the high and low pressure separation of oil and gas from 19 wells. This installation was described in some detail in the February 22, 1937 issue of THE OIL WEEKLY, page 67.

The present connection between well-head and separators consists of 6-inch or 8-inch flow line, dependent upon the production capacity of the well and length of the line. Originally these lines were buried with the idea of better protection, but due to the relatively large line temperature changes resulting from bean changes at the well-head, the pipe at times rose out of the ditches in dangerous bends that might have caused trouble. For recent wells, therefore, the flow lines have not been buried, this arrangement allowing for more liberal expansion room both in horizontal and vertical planes. An additional and important beneficial effect of this pratcice is the cooling opportunity afforded the crude oil before it reaches

Drilling mud conditioned carefully.



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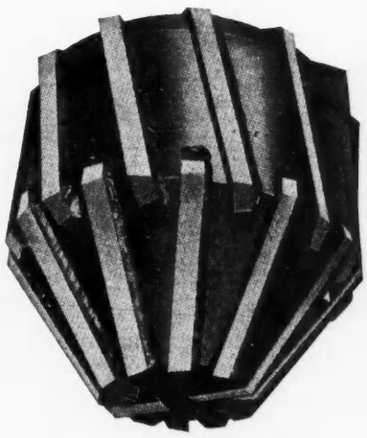

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the separators, a condition that facilitates separation of the oil and gas and retains more gasoline in the crude.

The central high-pressure separator battery involves a number of original installations. The arrangement permitted flowing the oil and gas together to this point and eliminated the installation of high pressure separators at each well. The centralized location facilitated control of the separators and reduced the number of flow lines from the well to a single conductor. Fear that unsteady flow would result from gas separation in the long flow lines proved groundless, and in practice the oil and gas maintain a fairly consistent mist of foam condition throughout the full length of the 6-inch flow lines. The line pressure drop is not sharp, varying from 10 pounds per square inch per mile for a 3000-barrel well to 48 pounds per square inch per mile for a 5000-barrel well. Flow lines over five miles long are operating satisfactorily, and gas separation is facilitated by cooling of the mixture in traveling from the wells to central separator battery.

Production from Poza Rica wells is passed through two series of separators, the first operating at a pressure of 17kg./cm2 (250 pounds per square inch) and the second at 2.8kg./cm2 (40 pounds per square inch). A third stage of separation is also effected at atmospheric pressure in 500-barrel bolted surge tanks. These tanks are connected between the low pressure separators and an oil metering station and serve the purpose of providing a gas-free oil, a condition found necessary for the accurate gauging of crude by a differential-pressure orifice meter. The vapor from the tanks obviously is very rich in gasoline content and is recovered for treatment at the absorption plants. The recovery of these vapors was undertaken not merely for the recovery of a high content of gasoline but to reduce the fire hazard which the liberation of the gas to atmosphere would create.

A 6-inch vapor collecting line is connected to the dome of each surge tank, and the gas for treatment passes via two gravel boxes to a 10-inch collecting line, which in turn is connected to two vacuum compressors operating at 15 inches mercury vacuum intake and 40 pounds discharge. The whole system is controlled by two vapor recovery regulators that give a sensitive control down to a fraction of an inch of water pressure. Emergency relief is provided by the installation of special relief valves.

For the measurement of both oil and gas, orifice meters of English manufacture have been adopted as standard. For high pressure gas and for oil metering, 120-inch differential meters are used, while for low pressure gas, meters with a maximum differential of 60 inches are installed. The centralization of separators in batteries leads to a very convenient system of metering installations, which are housed together for each battery of gas separators, and in one station for oil measurement.

For gas measurement interchangeable orifice fittings are used, but for oil metering ordinary flange connections are installed.

The presence of H_2S in Poza Rica gas renders it very corrosive in its action on fittings, and even on the mercury contained in the gas meters. It has been found necessary to provide a seal above the mercury. Although many types of liquid have been tried, the most satisfactory results have been obtained by the use of water seals.

Calcareous scale deposits have given a great deal of trouble with all flow connections. The flow beans have been particularly affected by these deposits, the openings having been reduced or almost stopped by the formation of scaly deposits. The scale consists chiefly of calcium carbonate, and adheres firmly to the metal. It apparently is deposited from the low percentage of carbonate-saturated water produced with the oil following reduction of pressure and release of carbon dioxide from solution. Special research to overcome this problem is under way.

The Mexican government administration, through its official operating company, has become active in the field. Three wells have been completed, and contract for drilling 10 additional wells has been awarded. The wells will be drilled in various parts of the field at locations agreed upon in the agreement recently made with the Aguila. The drilling contractors for the government have made every effort to reduce the drilling time. Heavier equipment than that formerly used at Poza Rica has been installed by these contractors, but such equipment also will be used by Aguila if existing uncertainties are eliminated.

An interesting attempt to reduce the number of casing strings will be made by the government contractors. The 16-inch casing will be cemented at 200 meters, and the 10¾-inch casing at about 2000 meters, or 6225 feet. Open hole will be drilled to bottom at about 7600 feet, and the well produced through tubing. The formations below 6000 feet are mostly hard, and show little tendency to heave. Elimination of a casing string represents a distinct saving, but only the actual use of such a casing program will reveal its feasibility. The use of tubing, in connection with a large amount of open hole and no oil string, will be an interesting experiment that may change the casing program for the field.

A central pump station in the field handles all oil produced at Poza Rica. Large steam pumps are used exclusively. Several of the older type boilers will be replaced with boilers to match the newer type now in use. Since gas for fuel is plentiful, steam power has proved both efficient and economical.

The electric power plant for the camp is equipped with three, 3-cylinder gas engines, but heavier engines, possibly diesels, will be installed if field development materializes.

An absorption gasoline plant treats the gas produced with the oil, and the daily gasoline manufacture approximates 1000 barrels. A larger and more modern gasoline plant will be built to handle the gas normally expected from two or three times the present number of producing wells.

The Aguila camp reflects a strong interest in the employee's welfare. The main camp includes a modern mess hall, club rooms, tennis court, swimming pool, and modern living quarters. Improvements in the workmen's colony will be made as soon as increased field operations justify increased expenditures.

The Poza Rica field represents perhaps the greatest single oil reserve in Mexico, and it is believed that orderly development on the part of Aguila and the Mexican government will place the field in a very strong position. Under the present development plan, about 150 wells ultimately will be drilled.

The lands, or surface rights, in the Poza Rica field are owned in small parcels. The usual royalty to the landowner is five percent. Aguila and the Mexican government obviously are the principal operators, and own practically all oil rights in the field. When any part of the field is declared a part of the public domain by the Mexican government, any royalty to the former landowner ceases. This change in status is similar to that in the United States, however.

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U. S. S. R.

Are her petroleum reserves sufficient to meet the ever increasing industrial demand?

By L. DAVID WOSK
Petroleum Engineer

THE Soviet Union's huge and ever increasing industrialization program raises the following questions: Are her petroleum reserves sufficient to meet the ever increasing demand? Are her technique and engineering at present, or will they be in the future, capable of producing her requirements from her reserves?

Many writers and commentators, most of whom have never set foot in a Soviet oil field, claim that either she has insufficient reserves or that she has insufficient ability to meet her requirements from adequate reserves.

Gubkin's Claims

At the Seventeenth International Geological Congress, Russia's leading petroleum technician, Academician I. M. Gubkin, claimed 6,376,000,000 tons of total reserves for the Soviet Union. These reserves were not entirely proved and in many instances constituted hypothetical reserves from areas insufficiently prospected to determine their true value. Many foreign geologists questioned the method of calculation of these reserves. A complete discussion of Dr. Gubkin's estimates and method of computation can be found in the articles by the author appearing in THE OIL WEEKLY, August 23 and September 6, 1937.

After the adjournment of the Con-

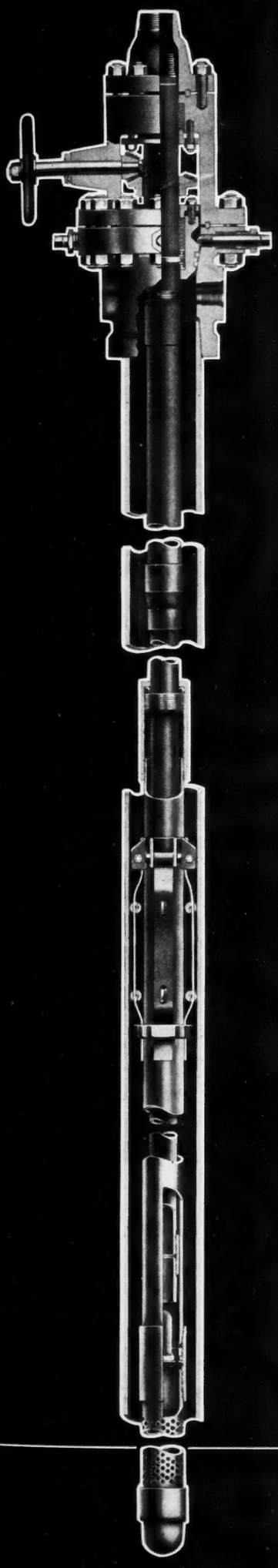
L. DAVID WOSK

MUCH has been written about the mooted question of Russia's crude oil reserves. Conclusions of Soviet engineers compared with those of engineers holding allegiance to other flags reveal a broad divergence of opinion.

In fairness to the Soviets it should be stated that most of the opinions written by the outsiders have been formulated on the outside or as a result of a brief stay in Moscow or one of the oil centers of the Soviet Union.

However, L. David Wosk, the author of this series of articles on the Soviet Union, beginning in this issue, a petroleum engineer of San Diego, California, is an exception. He went to the Seventeenth International Geological Congress in Moscow in 1937 to "cover" it for The OIL WEEKLY. He stayed in the Soviet Union to gather his data on fields *in the fields*, as shown by his itinerary on the accompanying map.

His treatment of the subject of Russia's reserves is meticulously thorough and his conclusions, you will agree, are based on logical reasoning.



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—Elimination of freezing of surface connections.

—Aids in retarding water encroachment.

—Reduces the gas-oil ratio, the degree of reduction depending on existing well conditions.

—Increased safety of operations.

—Generally prolonging the life of the well.

—Reduces emulsification.

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gress discussions, the author, together with many Soviet and foreign geologists, toured all the major fields in European Russia and had an opportunity to get first hand information concerning the geological progress, method of prospecting, and method of production, as well as many incidental features concerning these fields. In addition to the fields visited, considerable data was gathered, from Soviet geologists accom-

European Part of U.S.S.R.

Color denotes route of author

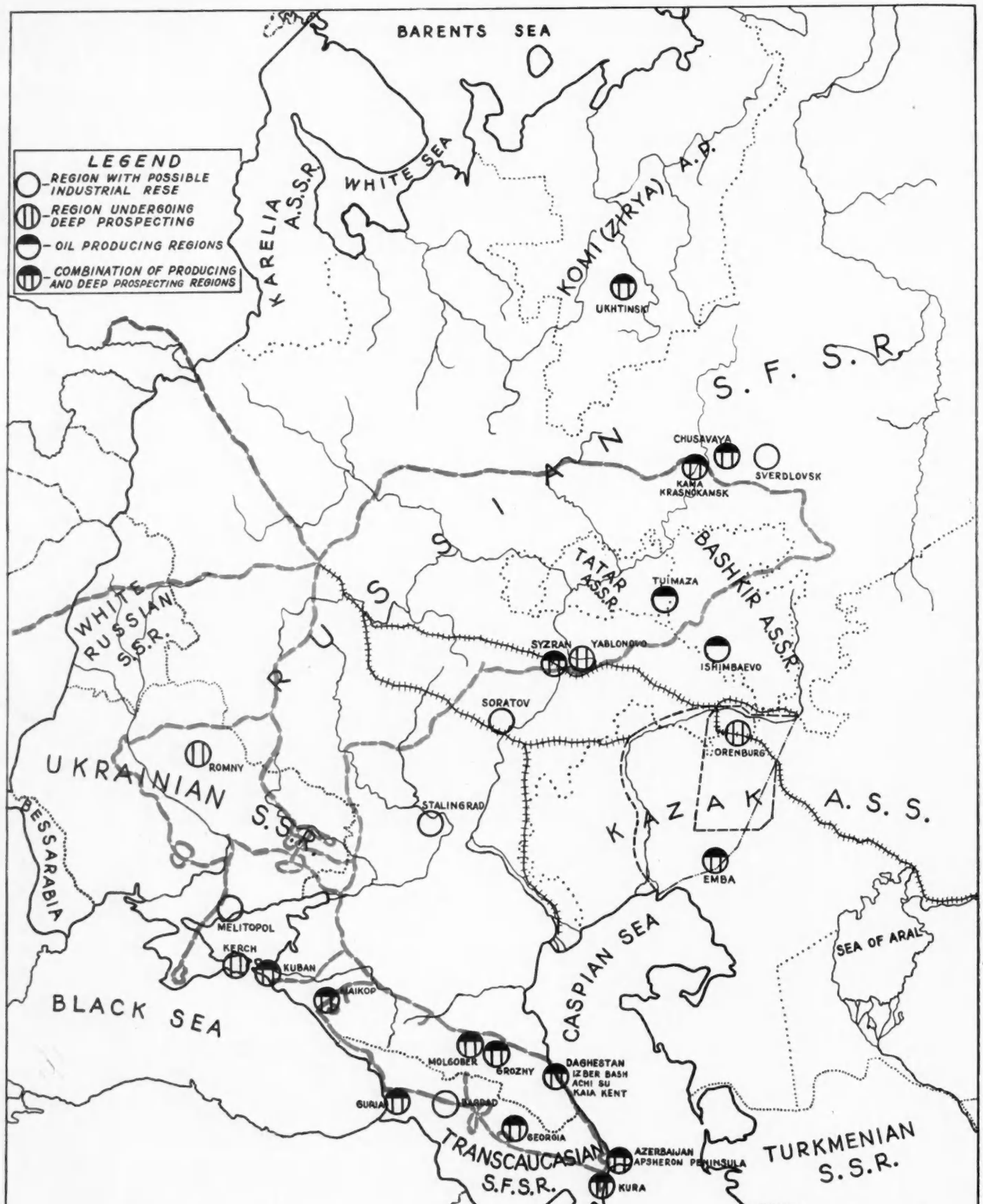
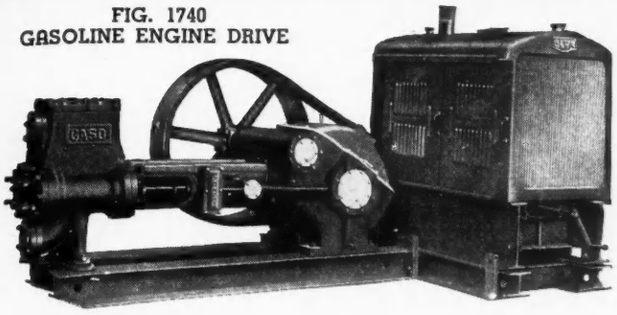


FIG. 1740
GASOLINE ENGINE DRIVE

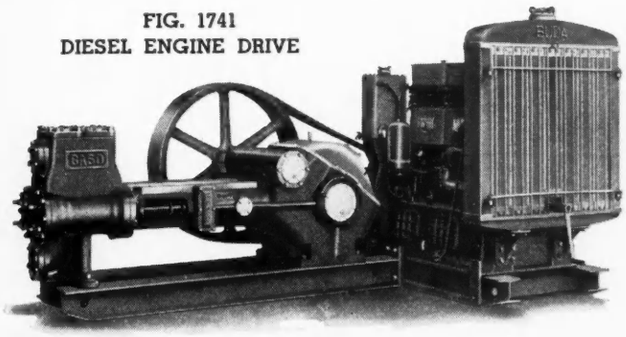


SERIES 1700 — POWER PUMPS

These pumps are designed to pump oil or water through long lines at pressures from 300 to 1400 pounds. Are admirably suited for pumping extremely large capacities at high pressures, having fluid ends with interchangeable liners from 2½" to 5" and from 5" to 7" x 10" stroke. Figure 1740 shows the pump with Combination Gas and Gasoline Engine drive, Figure 1741, with Diesel Engine drive.

These pumps possess all of the recognized GASO features. Crankcase is fully enclosed, and working parts operate in oil bath. Both pinion and crankshafts are journaled in Timken Tapered Roller Bearings of exceptionally large size and sealed off from the crankcase. Fluid ends can be furnished with special alloy steel liners, chromonized, or cast iron liners, bronze lined. All pumps are standard brass fitted, with steel piston rods. We can furnish any type of valve construction required for particular conditions. Pumps can be arranged for any type drive: (1) Pulley for belt drive, (2) direct connected to engine through flexible coupling, (3) electric motor through chain or reduction gears, (4) "V" Belt drive to electric motor or multiple cylinder power unit. Capacities 54 to 502 barrels per hour.

FIG. 1741
DIESEL ENGINE DRIVE



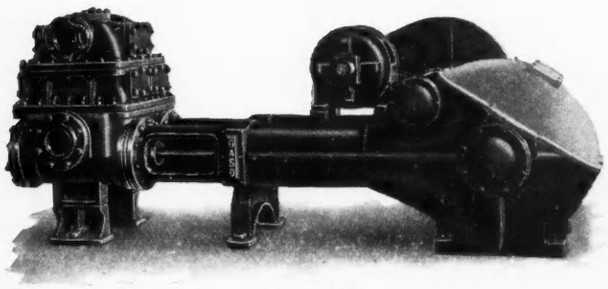


FIG. 1931

SERIES 1900 — SUCTION PUMPS

This pump is admirably adapted for suction service where a vacuum pump of large capacity is required, or for discharge where the service calls for a pump of large capacity and low pressure.

Features of construction include: Timken Tapered Roller Bearings, sealed off from crankcase; Monel Metal valves of light construction, with bronze seats; no over-lap of piston rods; wide face, stub tooth, semi-steel gear and forged steel pinion gear, running in oil; connecting rod crank end equipped with babbitt lined removable steel shell bearing.

Can be furnished with single train of gears and tight pulley, or arranged for direct drive by engine or electric motor through reduction gears.

Cylinder diameters 6" to 10"; capacities, 377 to 1045 barrels per hour.

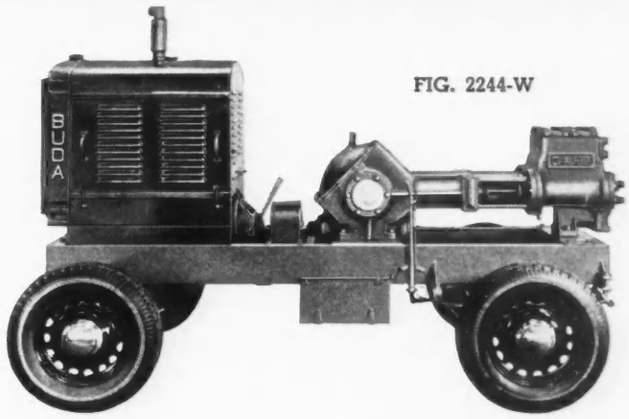


FIG. 2244-W

SERIES 2200 — PORTABLE PLANTS

GASO Series 2200 Portable Pumping Plants, mounted on trailers or skids, are the latest addition to the Gaso line, having been produced in response to a demand for smaller portable units than are offered in our Series 2000 plants. These pumps are adaptable for any type of emergency, temporary or semi-permanent oil field service, such as water lines, gathering systems, booster stations and pick-up service.

The same construction features are offered as in GASO models of much higher price, including enclosed crankcase, working parts running in oil bath, and Timken Tapered Roller Bearings sealed off from crankcase. Fluid ends can be furnished with special alloy steel or bronze liners for special service. Pumps are arranged to drive as illustrated, with internal combustion engine through flexible coupling; or electric motor drive can be furnished. Size range, 2½" x 6" to 6" x 6"; capacities, 46 to 288 barrels per hour.

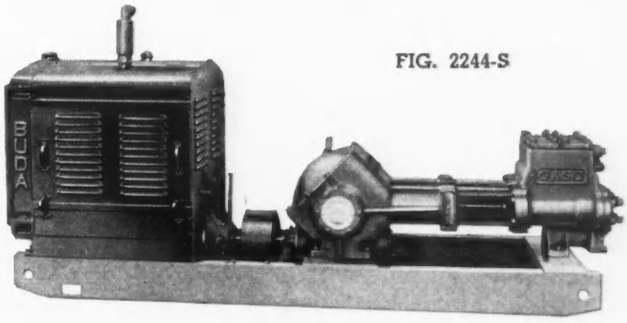


FIG. 2244-S

SERIES 2000 — PORTABLE PLANTS

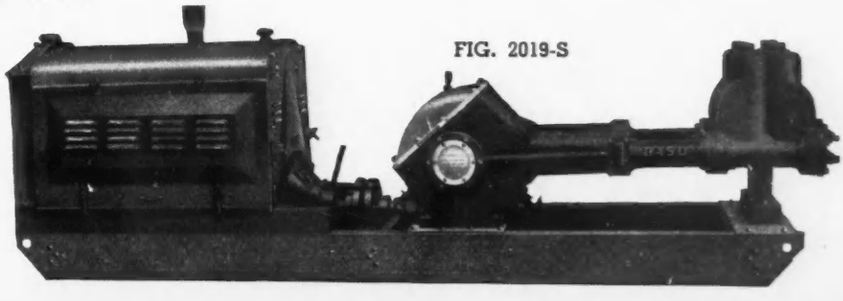
GASO Series 2000 Portable Pumping Plants, mounted on trailers or skids, are of larger capacity and of heavier construction than Series 2200. They are ideal for permanent or semi-permanent pipe line stations, water service for drilling operations, pickup in case of line breaks, mudding or cementing operations and for any other purposes that a general type pump can be utilized.

Pumps have the recognized Gaso features, including oil-tight and dust-proof enclosed crankcase, working parts running in oil bath, and Timken Tapered Roller Bearings sealed off from crankcase. Bearings for the steel worm are a double row of Timken Tapered Roller Bearings of large dimensions.

Power unit is 4-cylinder, extra heavy duty oil field type engine, of medium speed, burning natural residue gas or gasoline. Trailers have 10-inch channel iron frames, reinforced and welded throughout. Wheels are steel mounted on Timken Roller Bearings and equipped with heavy duty truck tires.

Pump cylinder sizes, 2½" x 10" to 7" x 10"; capacities, 59 to 508 barrels per hour.

FIG. 2019-S



panying the excursion, concerning other fields.

In this series of articles, the author wishes to discuss his observations in the hope that it will shed light upon the questions raised in the opening paragraph of this article, and to bring down to date the old data on Soviet fields.

The Soviet oil fields may in general be divided into nine areas. These will be discussed separately.

WESTERN URAL SLOPES
(The Permian Basin, Bashkirian Region, Kuibyshev Region)

The so-called Permian Basin of Russia, the area after which the Permian Basin of Texas is named, is adjacent to the large town of Perm on the western slope of the Ural Mountains. The growth of population centers and of industrial plants has intensified, in recent years, the search for oil in this area. Oil was first discovered as early as 1925 in the Permian Basin, 65 kilometers northeast of Perm. Work lagged until the discovery of the commercial deposit at Chusovskiye in 1934 and after additional development in 1936. Chusovskiye is not yet commercially important. Oil in this area is confined to the Uralian limestones of the Permian system and occurs at depths ranging from 243 to 391 meters. It is commonly thought to be reef type of production similar to that of West Texas and New Mexico. The local name for the formation is the Kunjurian of Permian Age.

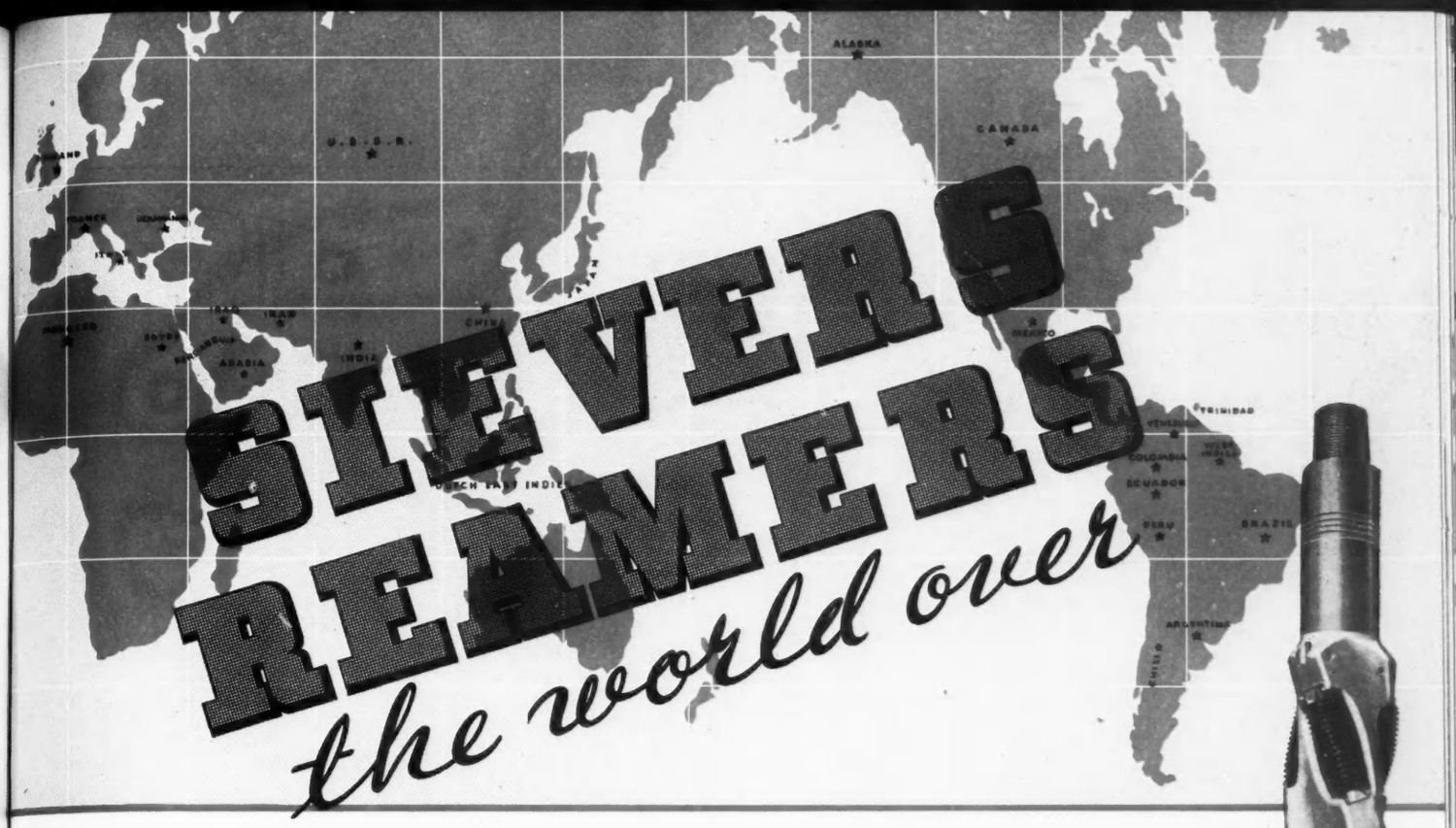
In the Krasnokamsk field, in the same area, the Permian is shallower, being 160 to 180 meters. Oil was discovered in well No. 7 late in 1936, in the Martyanian stage of the Moscovian division of the Carboniferous, below the Permian, at depths ranging from 900 to 950 meters. Soviet geologists anticipate production in the lower Carboniferous and also in the Middle Devonian. The accompanying geological section, marked Figure 1, shows the formations encountered in the Krasnokamsk field. The total thickness of the Carboniferous section in this area is estimated at 1100 meters and the top of the Devonian is estimated at 1700 meters, making deep prospecting feasible. In this area there are many evidences of buried hills or reefs. In the past two years, through geophysical work, upward of 15 structures, similar to those that produce in the district, have been discovered. Some are being tested. These are on a structural ridge 75 kilometers long and approximately 2 to 10 kilometers wide, with 100 meters closure.

Krasnokamsk Area

Figure 2 is the structural map of this area. This area has been prospected by magnetometer and checked by electrical methods. Additional checking was done by hand core drill to a depth of 30 meters. There are eight producing wells averaging 20 to 40 tons daily. There are 10 drilling wells, and by January 1, 1938, it is planned to have 20 strings of tools running. Rotary drilling is used throughout, using wooden derricks and three coal fed boilers per drilling unit. The derricks are 136 feet high and are of regulation types, except for an interesting feature of staircase running around the derrick rather than ladder ways. Generally the hole starts with 12-inch to 2000 meters, then is reduced to 7-inch. On all outpost wells, samples are taken every meter, whereas in proved areas, they are taken every five meters. Core recoveries in the Permian section are 80 to 90 percent, while in the Carboniferous they are only 50 percent. There are seven shut-in wells with a claimed potential of 100 tons per day total. The average completion time of a 950-meter well is approximately 60 days.

At present, very little Krasnokamsk oil is being shipped. Part of the production is being used for local

Map of the Asiatic Part of U.S.S.R.



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When a Sievers Reamer is used, you are assured of *Stabilization* giving a straight hole with minimum danger of twist-offs . . . *Reaming to Full Gauge* which permits each new bit to be run to bottom without reaming its way down . . . *Round Properly Conditioned Hole* in which casing can be run safely and without difficulty or loss of time. These exclusive advantages have established the SIEVERS REAMER as almost indispensable in present day drilling.

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Fig. 1. Single 3-point Reamer with Standard Cutters.

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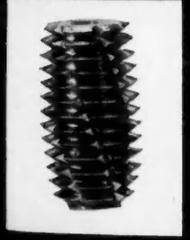
Fig. 2. Double 3-point Reamer, body may be forged or cast as specified.



Type No. 1 Cutter is furnished with all orders unless otherwise specified. It is suitable for reaming in all types of formations, including soft and hard shales, chalks, sandstones, conglomerates and igneous groups. This type of cutter is the fastest reamer cutter design known and is used in 95% of all jobs.

Type No. 2 Cutter is designed for stabilization in very soft formations, and is not recommended for any reaming operations.

Type No. 3 Cutter is recommended as a drilling bit stabilizer cutter for use with rock bits while drilling in the harder rock formations where the drilling bit penetration is very slow.

field requirements, some going to Sverdlovsk and some being used as fuel for the local electrical station. The oil varies in specific gravity from .925 (Permian) to .846 (Carboniferous). To date, there have been no dry holes drilled in the field and the field limits are not yet known. There is no water being produced, although bottom water has been found.

250-Meter Spacing

Wells are being spaced approximately 250 meters apart. They flow by agitation, and while it is claimed that the gas pressure in the field is 65 atmospheres, the author is inclined to believe that this is casing-head pressure rather than bottom-hole pressure, insofar as no bottom-hole pressures are yet being taken in the Soviet Union. Gubkin's estimate of 4,500,000 tons from this area, as of January 1, 1936, has been increased to 22,000,000, according to the field geologists, through their additional geological and development work.

Krasnokamsk Well Equipment

The wells observed were equipped with good safety devices, visual weight indicators, mud pump pressure gauges, etc. The wells were equipped with 3-35 horsepower coal or oil burning boilers and one additional held in reserve. In pumping equipment, they were using wooden jacks, 14½ KW. motor with 19 strokes per minute, 30-inch stroke. The completion string consisted of 6-inch, cemented to the top, with a 3-inch tubing string, three-quarter-inch rods and 2½-inch plunger. All pumping in this field is electrical.

It is interesting to note that gas/oil ratio studies have not yet been made, and the gas which is being produced is locally burned. No gasoline plants exist in the pool at present. The spacing program is entirely arbitrary and studies are being made based upon producing section thickness, viscosity, gravity and oil temperatures to determine the proper spacing.

In this area, the first production was found at Chusovskiye-Gorodki. The total production in 1935 was only 8000 tons. Production in 1936 dwindled to nothing. In 1936, the Krasnokamsk pool, on the Kama River nearby, was discovered. Production from this field is as follows: (in tons)

1936	
November	1500
December	1400
Total 1936	9100*
1937	
January	1400

*Including months prior to November.

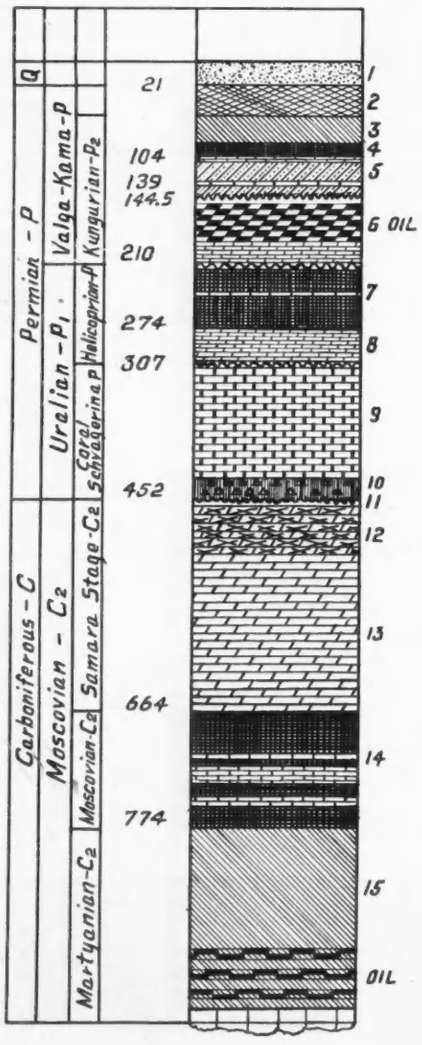


FIGURE 1
Section of the well P-7 in the Krasnokamsk oil field.

(1) Sands and pebblestones; (2) calcareous standstones; (3) clays with sands of limestone and gypsum; (4) argillaceous dolomites with intercalations of clay and anhydrite; (5) anhydrite with intercalations of dolomite; (6) solid and oolitic dolomites with bands of gypsum and clay, oil-bearing dolomites; (7) dolomites and limestone with *Brachyopoda* and stems of Crinoidea; (8) foraminifera dolomites; (9) coral limestones, alternating with foraminifera slightly argillaceous limestones; (10) zone of abrasion accumulations; (11) dolomite breccia; (12) dolomites with solution cavities and inclusions of gypsum; (13) dolomites and dolomitized limestones; (14) dolomitized limestones, dolomites, and limestone with *Yastengina*, alternating with calcareous clays, below oil-bearing.

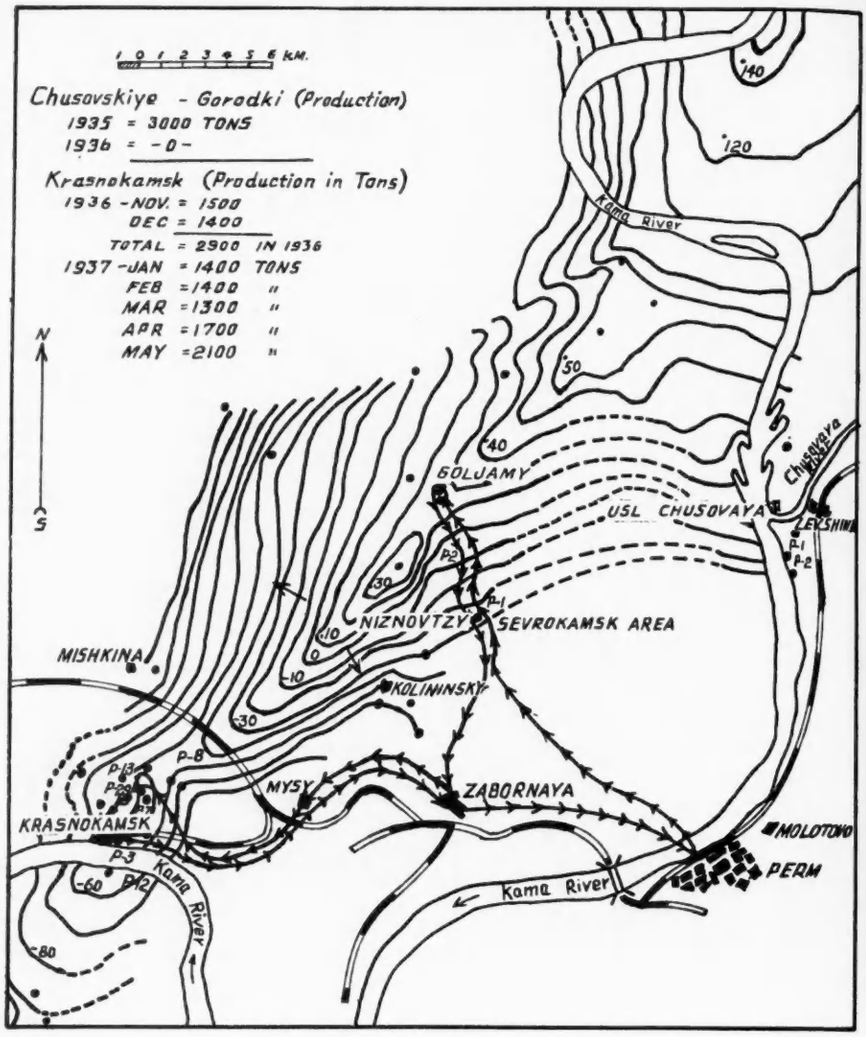


FIGURE 2
Structural map of Krasnokamsk field area.

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In the field geological office, which was well equipped, it was noted that electrical logging records were taken of each well, that complete studies of the waters were being made, and that the entire problem was treated in a scientific manner. In the field, the author noted that the equipment was very heavy, considering the depths being prospected. Lighter, portable equipment, similar to the American types, is being studied and it is planned to commence using it in 1938 throughout the entire Soviet Union. It is being built now in Soviet factories.

The conclusion reached by most of the Congress members on the tour was that the geological methods were modern and being diligently prosecuted, the drilling equipment fair, and the production engineering features mediocre. In this field, quite obviously, there is room for a great deal of improvement from an engineering standpoint. Undoubtedly, the area is extremely important and will produce a great deal of oil from the numerous untested structures.

Bashkirian Region

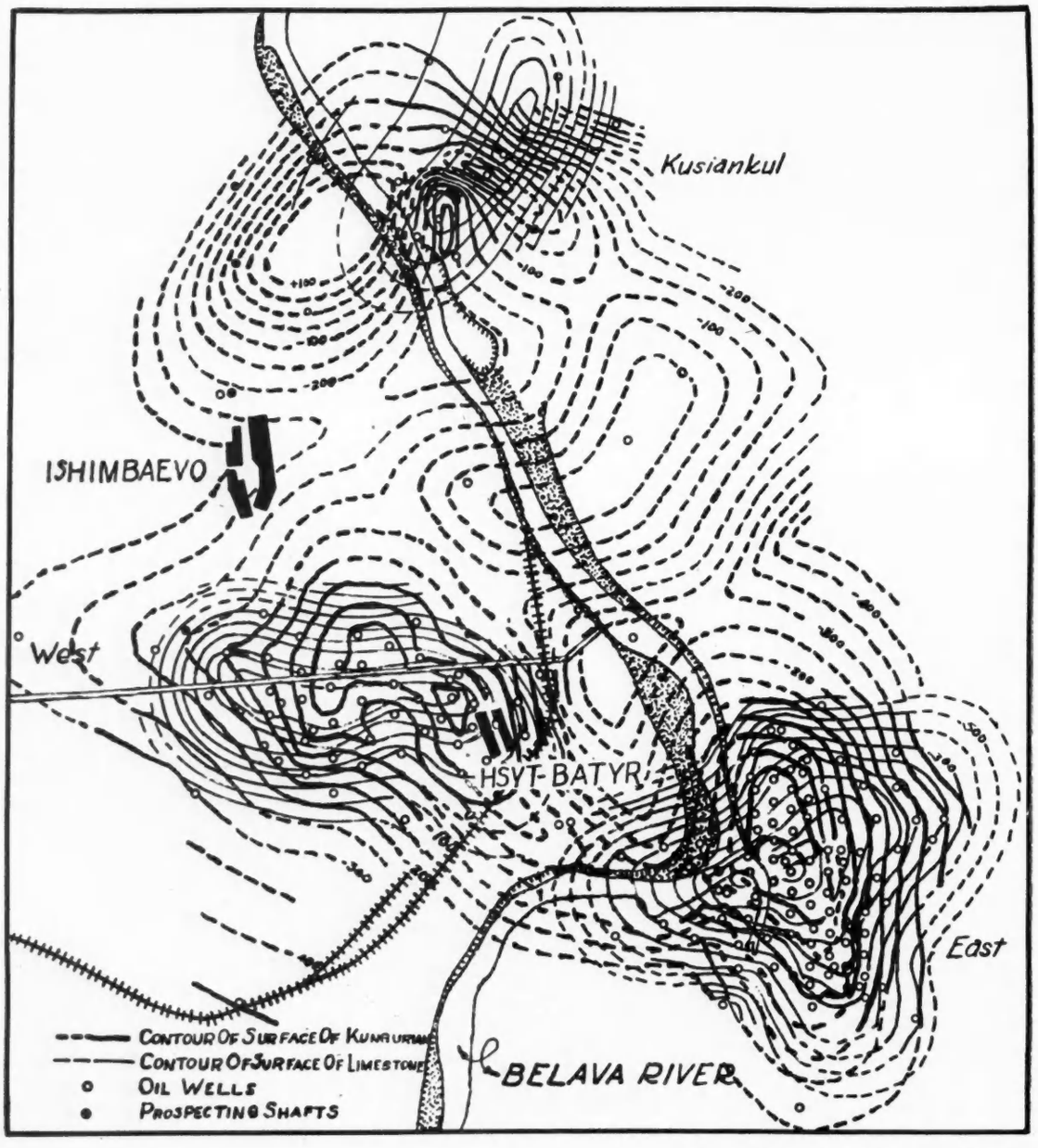
The producing area of Bashkiria lies at the end of the spur line railroad running from Ufa through Sterlitamak to Ishimbaevo. The type producing structure is similar to that of the Ural area in that it is of the buried ridge or reef type in the Permian lime. Oil seeps in this area have been known since 1768. It was not, however, until 1932 that commercial oil was produced.

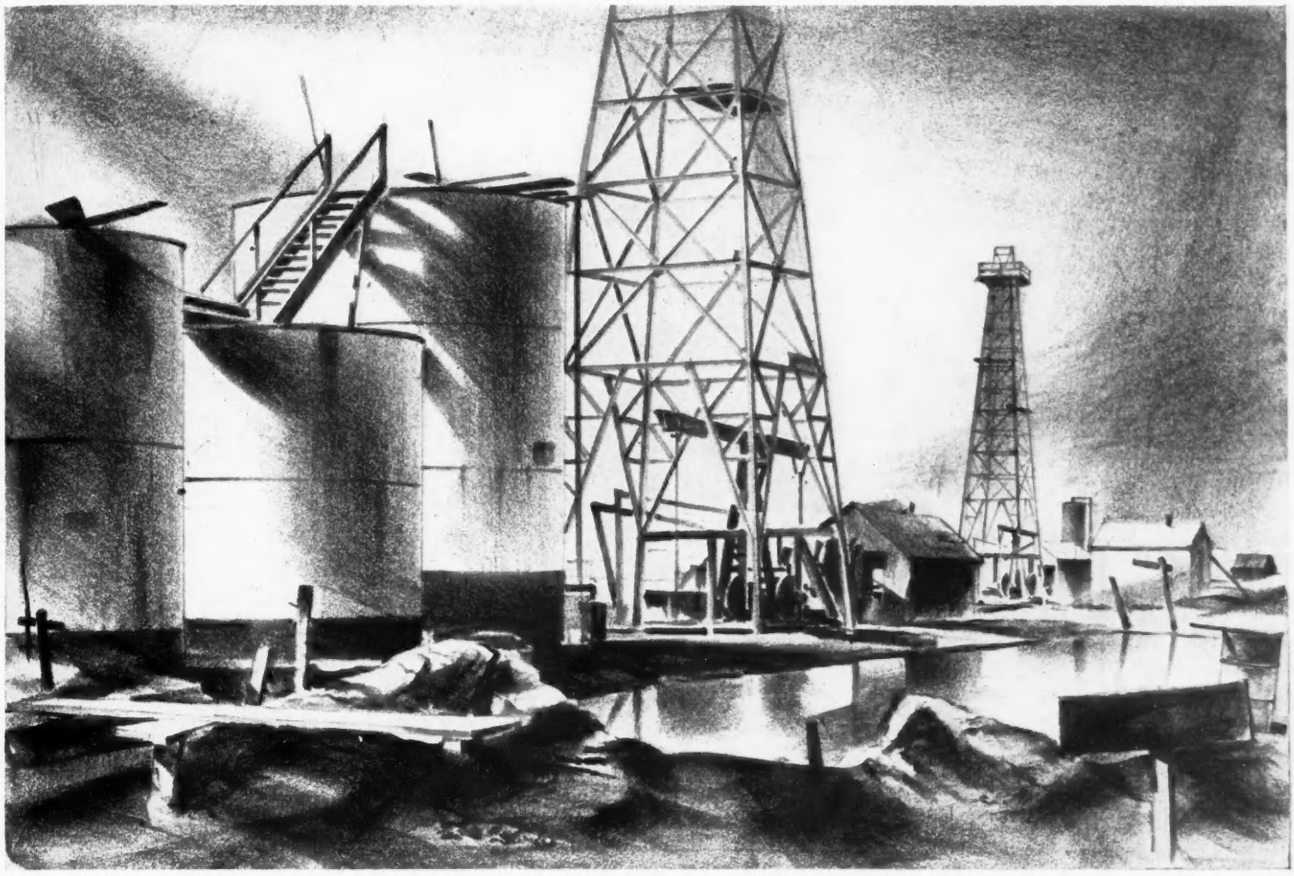
Production lies in a series of buried reefs paralleling the western slope of the Ural mountains. The folds of this area, while approximately 700 kilometers south from Krasnokamsk, are thought to be along the same general line of folding. If so, quite obviously, a huge basin exists which is not unlike the Permian Basin of Texas. The Russians feel that this is so and that as a result, the entire area along the Ural flanks offers tremendous possibilities. The author feels they are justified in their belief.

Ishimbaevo

Prospecting began in the area of what is now the Ishimbaevo oil field in 1929, after considerable preliminary geological and core drilling

FIGURE 3
Ishimbaevo area





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From a lithograph by E. M. Schiwetz

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work had been conducted. The first positive results were obtained in 1932 when two of four wildcat wells struck oil. At present, the Ishimbaevo area contains three producing fields. The accompanying map of this area shows these three pools, Figure 3. The oil from these pools is refined at Ishimbaevo although a 6-inch line has been built to a new large refinery at Ufa. This refinery, 120 kilometers from the field, is designed for cracking, in contrast to the topping plant at Ishimbaevo.

The oil in the fields is found in the dense and cavernous limestones of the Artinskian stage of the Permian. Similarity between the buried reefs of this area and those of the West Texas Permian Basin is noted by the salt and gypsum deposits in connection therewith. Commercial production, however, to date has been limited to the buried ridge proper, no flank production having yet been found. There are in this area 35 known, untested structures with a potential closed area of 200 square kilometers. Possibilities in this area are great. There are 10 wildcat wells being drilled at Present (January, 1938) on these structures.

In the Ishimbaevo pool, the average total producing horizon runs from 50 to 300 meters in thickness and the proved area covers 700 hectares. Production is found at depths ranging from 700 to 950 meters, although deeper wells have been drilled in the area to test the lower portion of the Artinskian stage. Both edge and bottom hole waters in this horizon are known and, while shows are found in lower zones, they have been non-commercial. The initial production varies from 100 to 400 tons per day, although one well came in with a production of 800 tons per day. The limits of the field are defined, except on the southeast and northwest flanks of the pool. The deepest hole drilled in the area, 1600 meters, had not drilled through the Carboniferous. To date, the bottom water level has remained stationary.

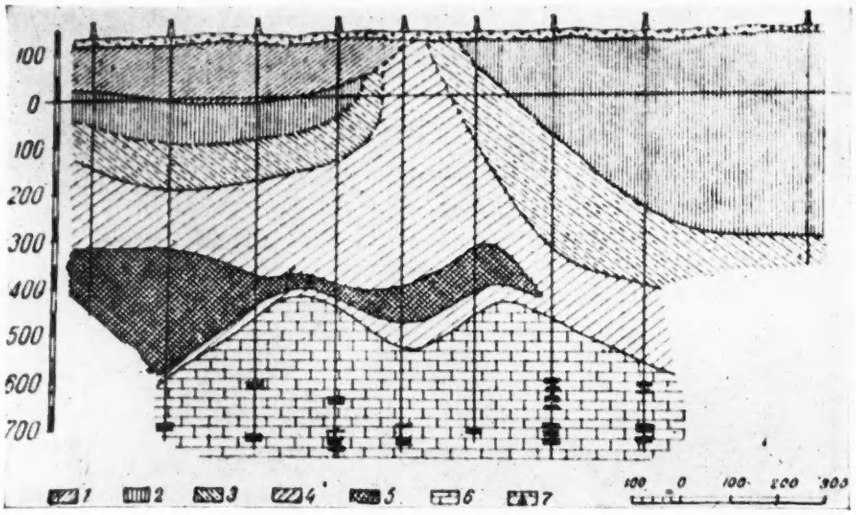

FIGURE 5

Kusiankul geological section according to data of the wells

(1) Akchaghylian stage; (2) Ufimian formation, middle divisions; (3) lower division (transitionary beds); (4) Kungurian stage (gypsum and anhydrites); (5) rock salt; (6) Artinskian stage, limestones dense and cavernous; (7) porous limestones.

Interesting Field

Gas is confined to the upper section of the lower Artinskian limestone, and there is considerable gas in the western and Kusiankul pools, where the shut-in pressure runs 70-75 at-

FIGURE 4

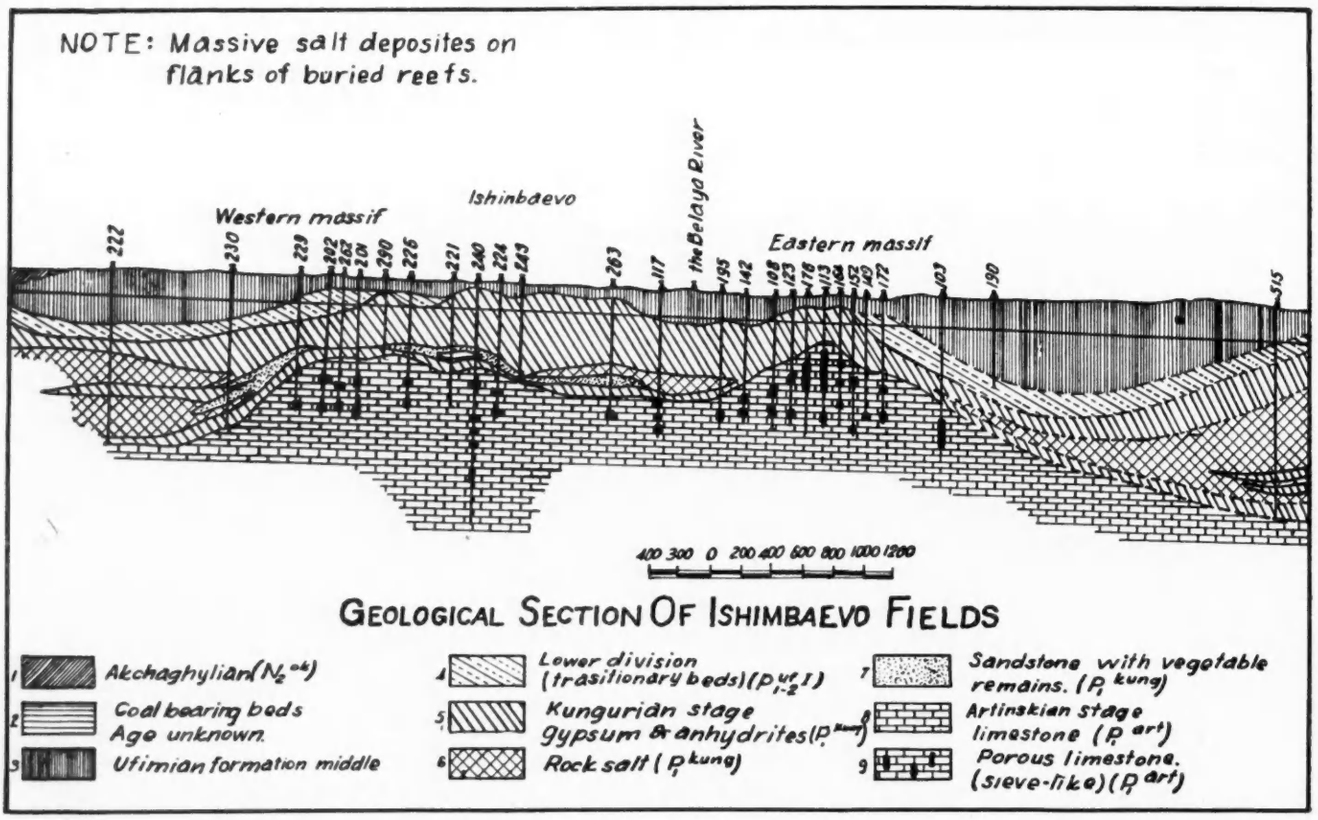

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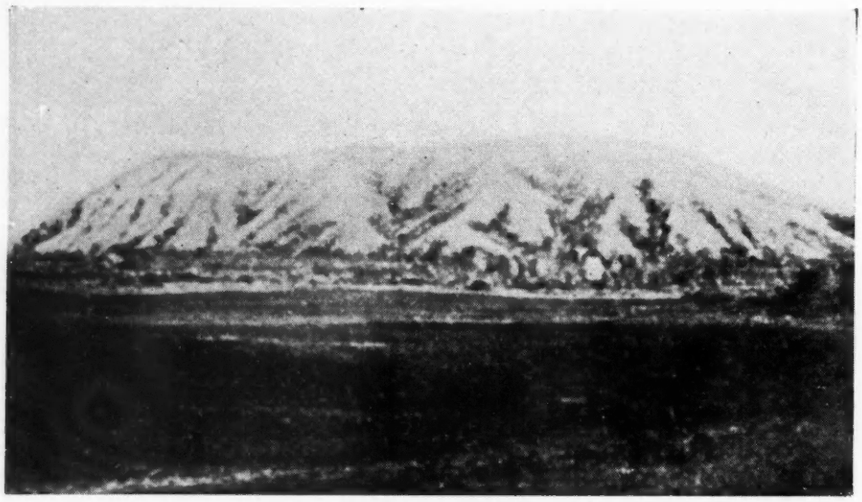
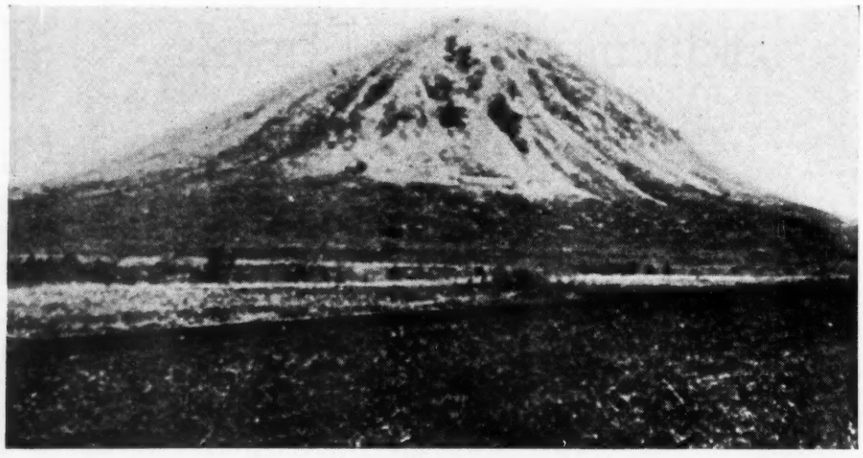
FIGURE 6



A—Shak-Tau Shikhan



B—Tra-Tan Shikhan

mospheres. In the eastern pool, due to extreme fracturing, no gas is found. Here, also, the initial production of the wells is lower than in the others. The specific of the oil is approximately .878 with a sulphur content of 2.5 percent, with 44 percent light fractions.

A great deal of interesting production and engineering data were obtained at this pool. The casing and completion program is as follows:

Sixteen-inch conductors, one joint; 12-inch to 115 meters; 8-inch to the top of producing lime section and cemented 100 meters up the hole. Producing section is drilled in with open hole, using oil in the completion process. All wells are acidized with from 4 to 15 tons each and respond with an increase of from 6 to 10 times the initial. The nominal well spacing in this pool averages 100 meters (about 329 feet), although some are spaced as close as 50 meters. The spacing program has been determined by trial for this limestone pool.

Drilling is entirely rotary, using a crew of four men working six hour shifts, four shifts a day. Steam for drilling is generated at a central plant for several wells. Drilling speeds in this pool average approximately 500 meters per month, with some crews doing 800 meters in as short a period as 25 days. Samples were taken every 2 meters in all drilling wells prior to 1935, but since then it has not been necessary. The equipment observed was chiefly Soviet in manufacture. The drilling bits last for 10 to 30 meters in hard limestone, 60 meters in anhydrite, and 60 to 70 average with a top of 100 meters in porous limestone.

Pumping was in the main electrical, although some gas pumping engines, 35 horsepower, were noted. These were modified small tractor engines of Soviet make, using waste gas from separators. This gas is drawn off from the casing and tubing, run through 2 pressure reduction regulators, and then through a special type distributing carburetor into the manifold.

No Water

There are approximately 150 producing wells in the fields, with 15 rigs running at present. Of the producing wells, 40 percent are flowing, 30 percent use air lift, and 30 percent are pumping. The field shows no evidence of producing any water. The gas/oil ratio is 100 cubic meters per ton of oil. It is claimed that no dry holes were drilled in 1937. The casing head pressure (flowing) is 8.5 atmospheres and no bottom-hole pressures are being taken.

In this area, geophysical prospecting and hand core drilling have been used extensively. The geophysical methods used include torsion balance, pendulum, seismographic, vertical and profile sounding, magnetometer, and gas surveying. At least 2 geophysical methods are used in an area to check before a wildcat well is drilled. Gas surveying is being experimented with extensively in the Soviet Union.

Shut-in pressure of this field when discovered was 75 atmospheres, while the present pressure is 45 atmospheres, showing a loss of 30 atmospheres in the life of the pool. Output from the pool is 3000 tons per day from 150 wells. Production figures are as follows:

	Tons
1932	4,479
1933	20,260
1934	63,161*
1935	405,800
1936	967,700
1937—	
January	78,100
February	66,800
March	78,500
April	89,600
May	84,000

*Estimate.

While the author was present in this field, it was announced that at Tuimaza, 200 kilometers northwest of Ishimbaevo, probably on the western limits of this huge Permian basin, commercial production had been found at 1060 meters in the lower Carboniferous. This structure covers more than 100,000 acres. This increases the possibilities of the entire area.

A visit to the local field office again demonstrated the complete data collected by the Soviet geologists. Electrical logging of wells is extensively used; modern geological field work is widely used, and very accurate

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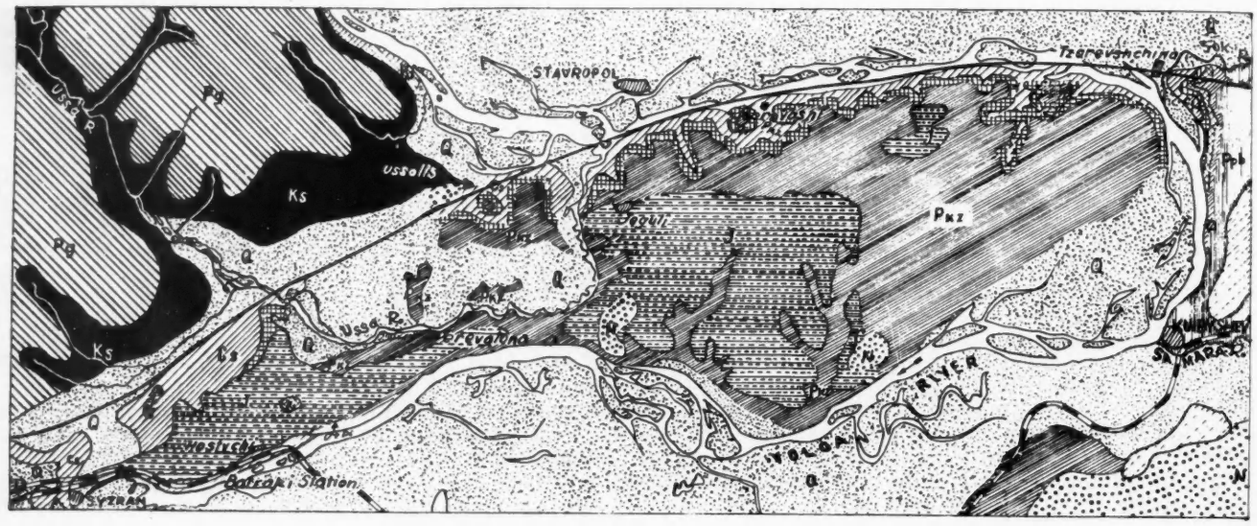


FIGURE 7
Geologic map of Samarskaya field

checks are being made on samples of formations and waters of all wildcat wells. In general, the geological work and mapping was being conducted in a very workman-like manner.

In the drilling operations, modern machinery was being used, although not of the best or the latest design. It was heavy rotary, rather than light portable, although the latter is contemplated.

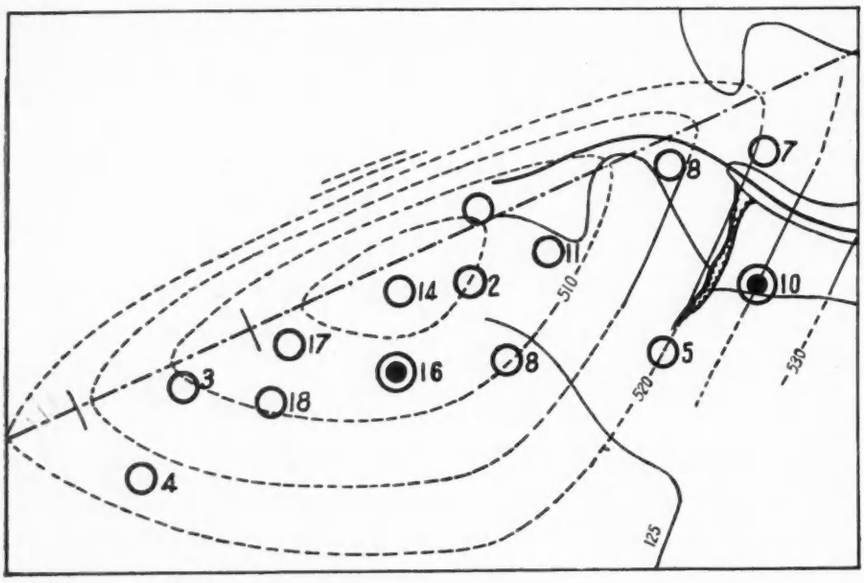
*Note: Also spelled diaper.

Smakaevo

Approximately 8 kilometers east of Ishimbaevo, apparently on the same buried reef, is the area of Smakaevo, whose production has been included in the above tabulation for Ishimbaevo. This area was discovered shortly after the Ishimbaevo discovery, and both gravity and electro-metric prospecting had been carried out. The peculiar feature of this structure, differing from the other producing ones in this region, is that it is a diapir* fold containing thick beds of rock salt and gypsum of Kungurian age within the crumpled core. While this field has not been commercially important, the showings being heavy tar-like petroleum, its importance lies in the fact that in this area there are numerous diapir folds and also, what are called "shikhans"—isolated, elevated mountains, sharply rising from the surrounding plains country. See Figure 6. These shikhans are cores of diapirs protruding above the plain. The shows at the Smakaevo diapir fold justifies prospecting upon other diapirs and around "shikhans," which are numerous in this region.

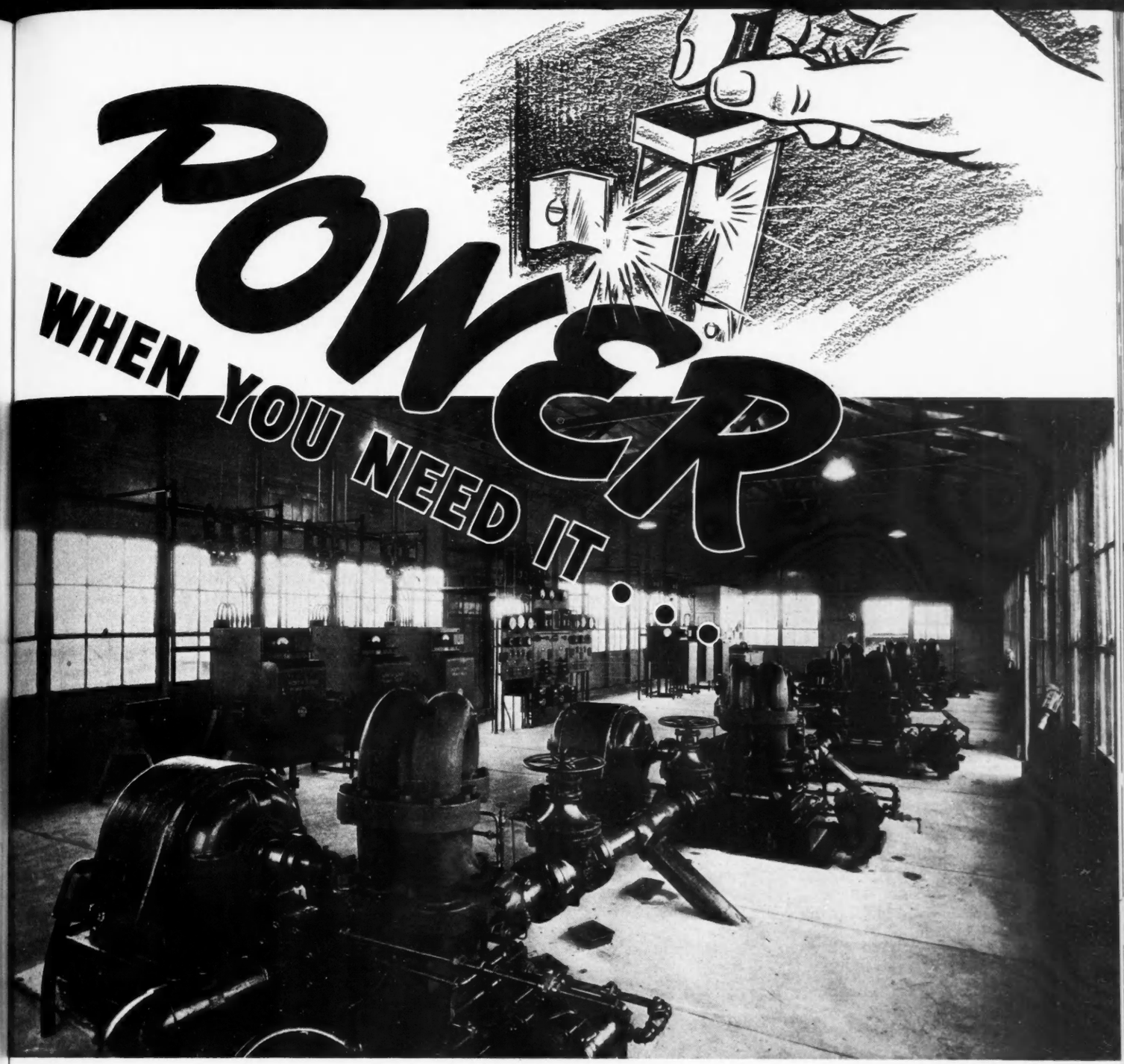
Again, the author feels that there is a great deal of room for improvement from the engineering and oil producing standpoints. Bottom-hole pressures were as yet not being made and were not well understood. However, the observations lead one to

FIGURE 8
Idealized structure map of Syzran oil field



"A" Horizon

"B" Horizon



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conclude that this vast area, with widely scattered pools on definite trends, producing from both the Permian and Carboniferous, must contain a great deal of oil which subsequent drilling will uncover. Geology has undoubtedly made tremendous strides, and while the engineering departments lag, there was evidence that they too may catch up soon with more modern techniques. Mr. Krems, chief geologist of Glavneft, the controlling organ of the petroleum industry, is aware of Soviet deficiencies in the engineering and producing branches. He stated that orders had been issued to correct these deficiencies and to bring them in line with American practices, as soon as possible.

Samara Bend (Samarskaya Luka)

This important area (see Figure 7), lying near the city of Kuibyshev, formerly known as Samara, promises to be another exceedingly important producing district. The area lies approximately 500 kilometers west of the Ishimbaevo district just discussed. Here the famous Volga River makes a large bend approximately 200 kilometers in length around a pronounced structural anticline, on the flanks of which local structures exist. Production has been found on one such structure. This large anticline, locally known as the Samarskaya Luka, runs east and west for a known distance of more than 60 kilometers and plunges under the surface mantle to the east. Extensive geological work on the eastern flank has been and is being conducted. The width of this anticline in a north-south direction is from 20 to 30 kilometers with the flat limb pitching to the south.

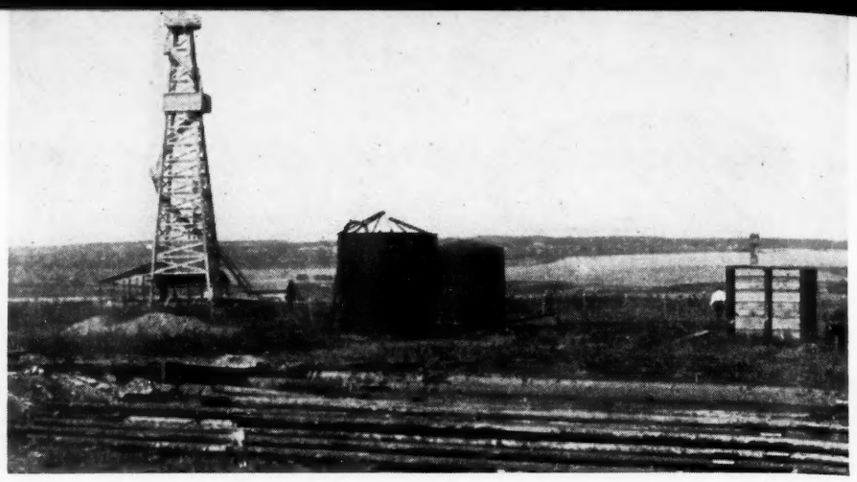


FIGURE 9

Completed well in the Syzran field

Along the northern flank of this structural feature is a series of hills steeply rising from 250 to 300 meters above the river level. This ridge, known as Jiguliridge, is accounted for by the existence of extensive dislocations or faulting, and the fields located thus far have been in structures along and closing against this Jiguli fault. The folding in the producing area of Syzran in the western part of this large anticline is Pre-Jurassic in age. Samarskaya Luka is a very complexly folded area with a great deal of detailed work necessary in order to determine the local geological features. Outcroppings on the surface are the Carboniferous, Permian, Jurassic, Cretaceous, and Tertiary deposits. At many points asphalt seeps are found, and in some places they are of sufficient magnitude to be worked commercially. The most important asphalt deposits are found in the middle Jurassic series. The source of the asphalt undoubtedly comes from the oil horizons of greater depths and results from migration along faults.

The Syzran oil field (see Figure 8), most important of the Samarskaya Luka area, is located 7 kilometers north of the town of Syzran on a large structure closing against the Jiguli flexure. Prospecting commenced as early as 1931, but because of the fear of drilling close to the fault, the wells were drilled too far down the dip and were therefore dry. These failures discouraged further development until early in 1937, when six more wells were drilled within the area at depths ranging from 656 to 1416 meters. The deepest of these wells penetrated upper Devonian to a depth of over 200 meters. The other wells stopped in the Carboniferous.

Gubkin Found It

Credit for the final discovery of oil is given to Dr. Gubkin, whose faith and persistence were responsible for opening this area. The well which penetrates the Devonian, while too far from the crest of the structure to produce oil, indicated some dolomitization which has encouraged the geologists, making them feel that deeper possibilities exist, on the crest of the structure. To date, the outlines of the Syzran pool have not yet been determined, and geophysical methods have not been proven successful. Drilling is the only method which has proven adequate.

There are two oil bearing horizons, A and B. Horizon A, at depths ranging from 640 to 680 meters, produces small wells, one to two tons of oil per day. Horizon B, at a depth of 1000 meters, produces wells of 50 tons per day. Larger wells in this horizon are not uncommon. The overall thickness of the productive zone of horizon A totals 12 to 14 meters, of which 4 to 5 meters are sandstone, tight in character and very impermeable, with a low and variable saturation. Water is often found in the oil bearing sand. Immediately below this section A is a limestone section, 30 to 40 meters

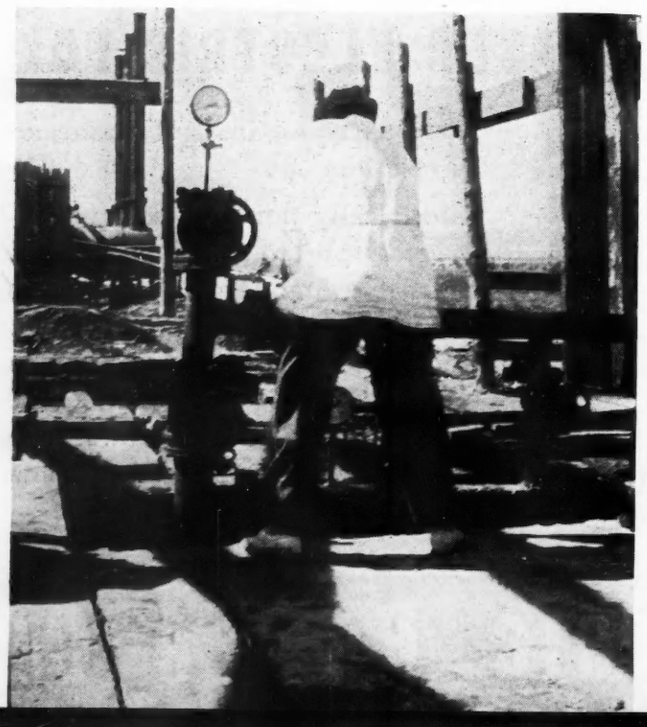


FIGURE 10

Opening a well in the Syzran field.

thick, which is believed to be productive on top of the structure. This belief has been strengthened by the fact that well No. 15 has penetrated this section 12 meters and found saturation throughout. The oil from horizon A is heavy (.890 to .900), and sulphurous (1.5%).

Horizon B, the more important of the two in the field, has been penetrated by 3 wells. The first to discover oil in this section was No. 10, which drilled in April 23, 1937. On July 2, 1937, No. 16 was completed at 1040 meters for a daily production of 130 tons. The gravity of this oil is .870, with considerably less sulphur content than that noted above. The casing pressure is 10.5 atmospheres, the tubing pressure 12 atmospheres. Very little gas was observed in connection with this oil. The oil is black, though very live. This well has demonstrated the potential possibilities of the B horizon, not only in Syzran but in the other structures of Samarskaya Luka. Below this Carboniferous horizon. Devonian production is considered possible on the crest of the structure.

Syzran Productive

In this area, Syzran is the only proved structure. The approximate productive area is 2500 acres with one proven valuable horizon, the other of doubtful value except on a relatively small scale. In addition, there is one structure, Yablonovo, being tested, one structure mapped for testing, and nine others known but not yet detailed. The structures here referred to are all approximately the same size.

Other Structures

There are other structures in the proven portion of the Samarskaya Luka lying in folds parallel to the Jiguli flexure and at slight angles to it. These, however, are relatively small and considered unimportant at present. The full extent of the Samarskaya Luka has not yet been determined, but it is thought that structures not reflected on the surface may be discovered east of the present productive area, although they will be difficult to locate. The prospecting methods used so far have been electrical, gravimetric, reflection seismograph, all of which have proven inadequate. The only adequate method to date has been that of surface mapping based upon fossil correlation and core drilling.

Samarskaya Luka also extends southwest for an undetermined distance, and intensive geological work is being carried out there. Oil is being taken from Syzran to Batroky, on the Volga River, a distance of 20 kilometers, through 10-inch pipe line. Present production is very small, and no detailed figures are available. Because of the youth of this pool, it is not yet known what final disposition of the oil will be made. In all probability a refinery will be constructed at Samara, or the oil taken to the refinery now existing at Saratov, approximately 150 kilometers down the Volga River.

In the drilling operations conducted in Samarskaya Luka, large wooden derricks were noted, with all drilling equipment of Soviet construction. Automatic weight indicators were being used throughout. Mud mixing tanks and sample thiefs in the mud sluice for automatic sampling were observed. The field being new, there was very little data available. The field geological office contained complete cores, electrical logs of all wells drilled, excellent detailed geological and geophysical maps as well as facilities for studying oil and water samples. Again, good geological work and fair though inadequate drilling and producing technique was seen.

Yablonovo Being Tested

Yablonovo structure, which is being tested, is virtually assured of production from indications in down flank wells already drilled. One well drilled on the flank to 1172 meters went through the Carboniferous and penetrated the upper Devonian. This well noted a Carboniferous section identical with that at Syzran and found good shows of oil in the sand and lime section of Series A and better saturation in Series B. The accompanying map, Figure 11, shows the location of this test as well as that of the two tests in progress. No. 2 location is preparing to test the A series and No. 3 is a location for a deep test.

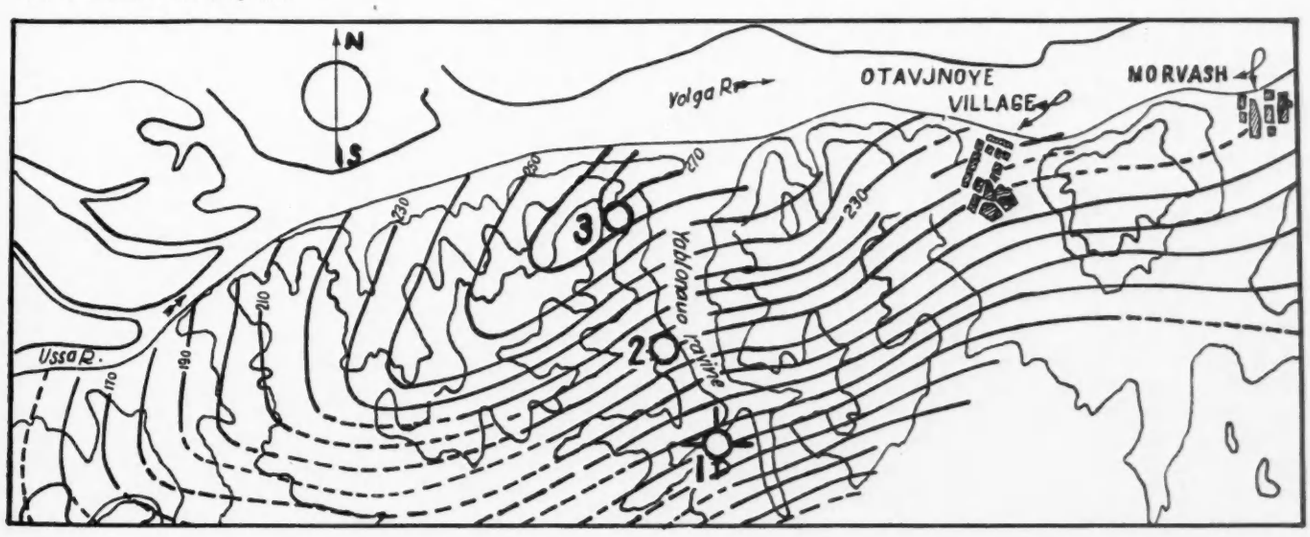
In the opinion of the author, the Samarskaya Luka area will prove of considerable importance from both the proven as well as known but untested structures; from the proven Carboniferous horizons as well as deeper Devonian possibilities.

To be continued

FIGURE 11

Contour map of a part of the Yablonovo Ravine on the rof of the Schwagerina horizon.

No. 1—Dry and abandoned. Oil shows in "A" horizon and good shows in "B" horizon.
No. 2—To test "A" horizon soon.
No. 3—Location for deep test.



Colombia

Barco concession, with shut-in production 14,000 barrels daily, will have 50 wells drilled during 1938 and may be provided with pipe line outlet

As has often been true in the history of civilization, the dreams of yesteryear are the facts of today, or tomorrow. So it has been with the Barco concession, far back in the jungles of Colombia, South America. The dawn of reality approaches for the visions of geologists of Gulf Oil Corporation who pioneered years ago work that promises in 1938 to make the Barco Concession, now operated by Colombia Petroleum Company, one of the hottest spots of field activity in South America.

Shut-in production on the concession as of February 7, 1938, totaled about 14,000 barrels, or just 9000 barrels shy of the figure which will make it necessary, under terms of the concession grant, for the concessionnaire to build a line from the Barco to tidewater, which is about 200 miles as a crow flies.

Six wells were drilled on the concession in 1937. Two of these were wildcats and dry; two were producers on La Petrolea structure near the southeastern tip of the concession, and the other two were producers on the Rio de Oro structure at the northern end of the concession bordering the Venezuelan boundary.

To Drill 50 Wells

That does not sound so much like a hot spot—but the picture changes with announcement that the Colombian Petroleum Company will sink 50 wells on the concession during 1938. Part of them will be wildcats, for while the Barco is said to contain at least five structures, only two of them, La Petrolea and Rio de Oro, have been given a conclusive test with the drill.

To expedite the drilling campaign and assure itself of proper equipment for wildcat drilling, Colombian Petroleum Company has five new rigs enroute the Barco concession from the United States. Cabled advice from the concession February 7 stated three rigs were running and three were rigging up. These, together with the new ones, will make 11 rigs available for carrying out the plan to drill 50 wells during 1938. Two of these rigs used for wildcatting on the concession are capable of going to 8000 feet, considered ample to test the Cretaceous.

While a very complete article on the concession appeared in the December 21, 1936, issue of The Oil Weekly, considerable water has gone over the bridge since then, since the new operators have gone into action for Socony Vacuum Corporation and The Texas Company, fifty-fifty owners of the operating company.

Rio de Oro Field

Possibly the most important of events lately was hitting the correct structural position on Rio de Oro anticline for location of Rio de Oro 5. It was completed in January, 1938, for an initial production conservatively estimated at 3600 barrels at the gratifying depth of 1300 feet. This was really the first big well on the Rio de Oro structure, and the quality of the oil is highly satisfactory—37 gravity and clean, with a negligible amount of paraffin. Casing pressure on Rio de Oro 5 was gauged at 650 pounds before it was shut in for lack of an outlet. No. 5 gives the cue for location of several more tests on that part of the anticline this year. Rio de Oro field produces from Eocene sand, bottomed in the deepest producer at 1615 feet. Shut in production of the two producers completed there is 3750 barrels.

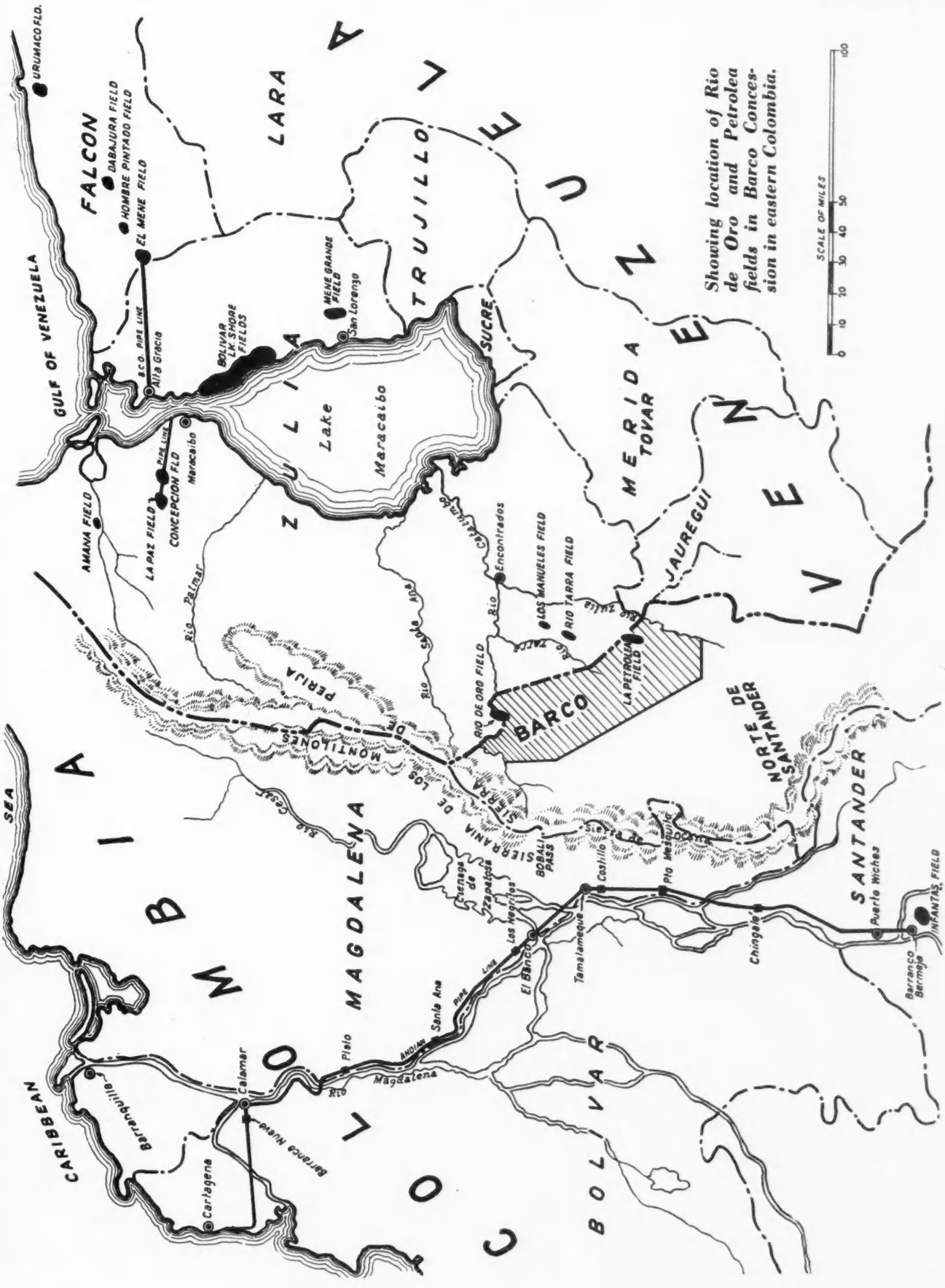
On the other hand, La Petrolea field, said to be the only Cretaceous production in the northern part of South America, has a shut-in production of about 10,250 barrels per day built up by 13 successful completions. Rio de Oro structure has two dry holes, not including the discovery well which has sanded up or become clogged for some reason. Seven dry holes have been drilled on La Petrolea.

La Petrolea Field

The structure of La Petrolea embraces two domes, the north and the south dome. Practically all of the production thus far is on the north dome, the exception being a small 175-barrel well, No. 16, on the south dome. Five failures have been drilled on the south dome, but two of these were in the saddle between the north and south domes. All were tests to the Lower Cretaceous. Upon penetrating the Lower Cretaceous, water was encountered. So in the vicinity of the well which found this water in the Lower Cretaceous at La Petrolea it is contemplated that future drill-

ing will be projected to points higher, or at lesser depths.

La Petrolea has no true sands, but produces from limestone formations, comparable in a general manner to those of the fields constituting the Faja de Oro, or Golden Lane, of Mexico. The latter is referred to as the Tamasopa line. Whether the pro-



duction from lime at La Petrolea comes from fractured or porous limestone has not been determined.

The field has three productive zones, with the depths varying from 400 to 1602 feet. (These depths are form the rotary table. Elevations are not available. Gravity of the oil produced on this southern structure varies from 40 to 47 degrees, the oil recovered being lighter as the depth of the well increases, as a general rule.

With respect to the wildcatting going on on the Barco concession, which is comprised of 200,000 hectares (a hectare equals 2.47 acres), Colombian Petroleum Company is drilling one exploratory test 15 miles south of La Petrolea field on what has been called the Leoncito structure—named after Leoncito creek. This wildcat, projected to 5000 feet to test the Cretaceous, was drilling at 2068 feet in shale February 7. Down to that depth it had recorded only a few unimportant cuts or rainbows.

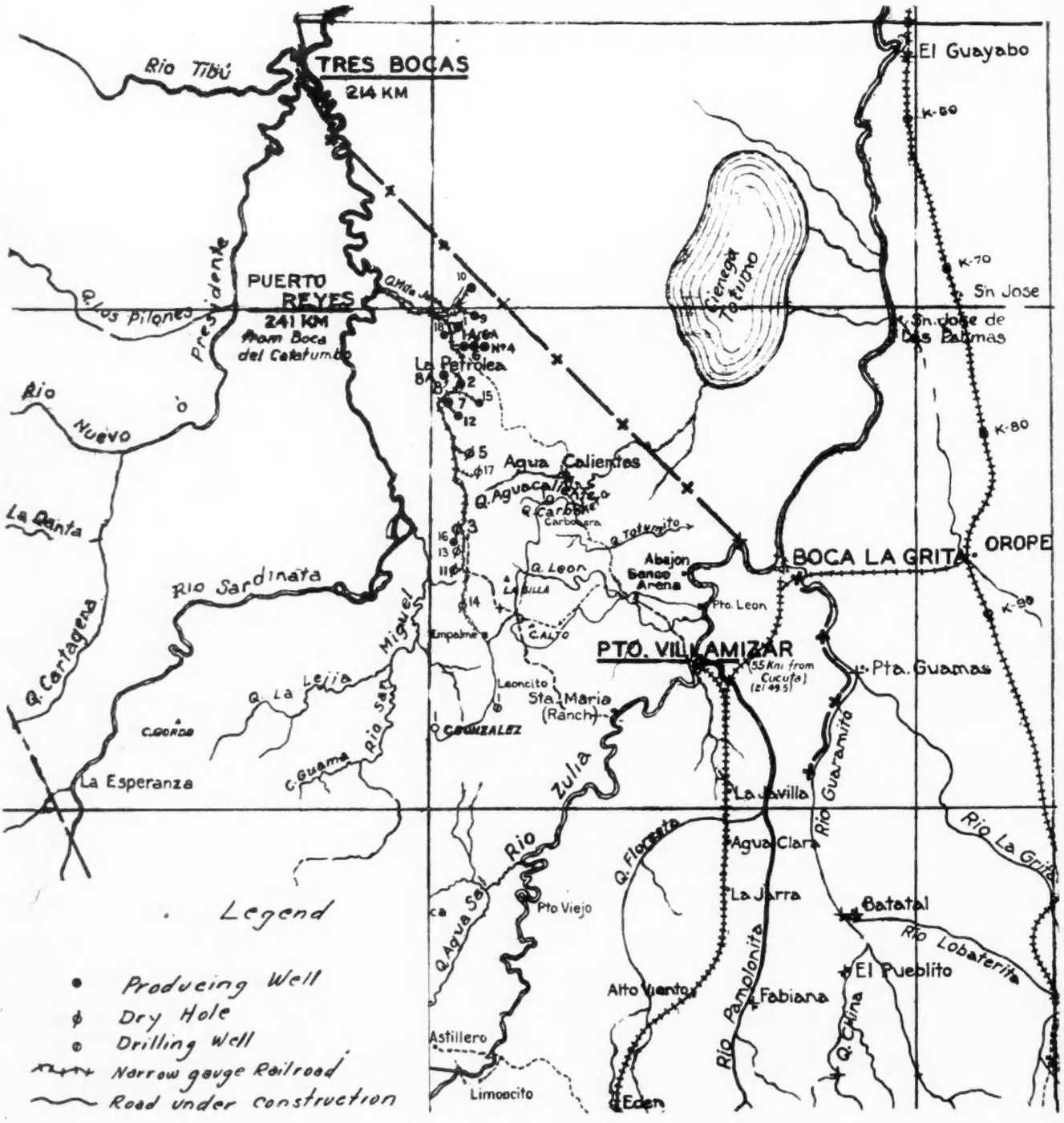
Another important wildcat, situated in the Puerto Barco area, south of Rio de Oro structure, was abandoned in Lower Cretaceous during the year at 6317 feet.

However, location has been made for two new wildcats on the concession. One, six kilometers southeast of La Petrolea has Eocene for the objective. Another, 20 kilometers south of La Petrolea will test the Cretaceous.

Although production has been found and is expected at relatively

[*Continued on page 166*]

The La Petrolia field area of Colombia on the Barco Concession



Iraq

Development of second important field in this country may call for another major pipe line project in the very near future.

NEWS wafted through some months ago that capacity of Iraq Pipe Line Company's line from fields in Iraq to tidewater on the Mediterranean Sea was being taxed by production of the Kirkuk field.

It was assumed in some circles, however, that capacity of the line might be allowed to stay as it was, at from 80,000 to 86,000 barrels per day, because such a program allowed operation of Kirkuk field on such an ideal basis as to cause it to be referred to constantly in engineering circles as the most ideally, efficiently operated field in the world.

Qiayarah Field Important

That might have been Iraq Petroleum Company's program for years had it not been for the success of its controlled organization at Qiayarah, British Oil Development Company, Limited. Now it looks as though the great engineering feat of building the Iraq pipe line from Kirkuk to Tripoli and Haifa on the Mediterranean may be repeated.

Why? Shut in wells on the structure at Qiayarah in Iraq already number 52. They await an outlet. And the government of Iraq wants them to have it soon. These wells, according to reliable sources, have initial production ratings ranging from 1000 to 50,000 barrels per day, individually. Taking the minimum rating of 1000 barrels per day, a shut-in production of 52,000 barrels per day has been chalked up. But approaching the matter nearer the actual condition, but still being ultra-conservative, assume that the overall average of these wells rated at from 1000 to 50,000 barrels daily is only 2000 barrels per day, slapping on the choke. This would mean 104,000 barrels per day from Qiayarah. Compare this figure with that of the present maximum pipe line capacity of the Iraq line.

Early in 1938 surveyors were busy picking out a route for a line to run from Qiayarah, 45 miles south of Mosul, to Iraq Petroleum Company's line running from Kirkuk to its forking point at Haditha. This would mean that only about 45 miles of line would have to be built if a tie-in with the line from Kirkuk to Haditha were contemplated. But information received from Mosul is to the effect that the contemplated line from Qiayarah to tidewater merely will parallel the old line. Hence the probable length of the new line will be a bit greater than that of either branch of the $50,000,000 line in operation. The combined length of the two branches of the existing line is about 1500 miles.

Asphalt Crude

Qiayarah is similar in many respects to Kirkuk field, a complete description of which may be found in the August 16,1937, issue of THE OIL WEEKLY. Qiayarah's oil is heavy (17 gravity) and has an exceptionally heavy sulphur and asphalt content.

The nature of the oil produced at Qiayarah involves another problem in transporting it by pipe line to tidewater. It will have to be treated before it can be piped, a situation which calls for construction of plants to handle this detail. This problem was handled when dealing with Kirkuk crude by fractionation, which eliminated the undesirable gasses, mainly hydrogen sulphide, and retained the valuable hydrocarbons.

Stabilization of Crude

In handling the Kirkuk crude, oil at a pressure of 50 pounds per square inch is charged to the stabilization plant which processes in two stages. The first stage secures the elimination of the undesirable constituents, effects a light topping of the crude and the partial fractionation of the light distillates. The second stage fractionates the light distillate and the vent gas from the first stage, and the topped crude from the first stage is blended with the stabilized light distillate to produce the stabilized crude. The undesirable constituents in gaseous form are used as fuel and the excess led away to a burning point. The plant is designed in three units, two of which are capable of handling the complete throughput of the pipe line, leaving one unit as a standby. It is probable in view of the success of handling the Kirkuk oil that a similar scheme will be employed for Qiayarah oil.

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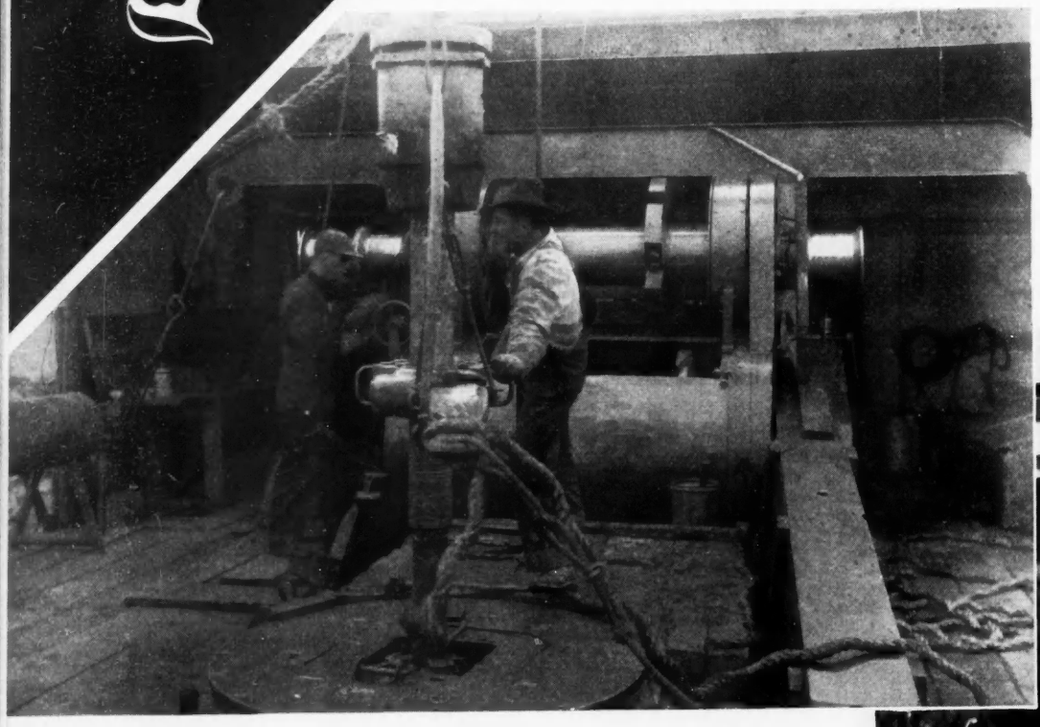

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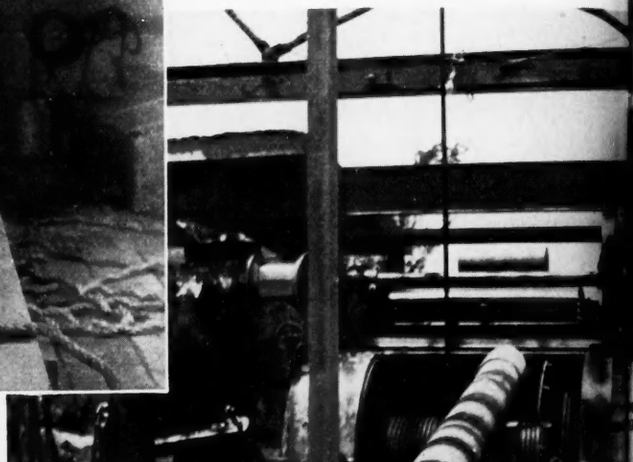

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ROTATIVA A HERRAMIENTAS DE CABLE

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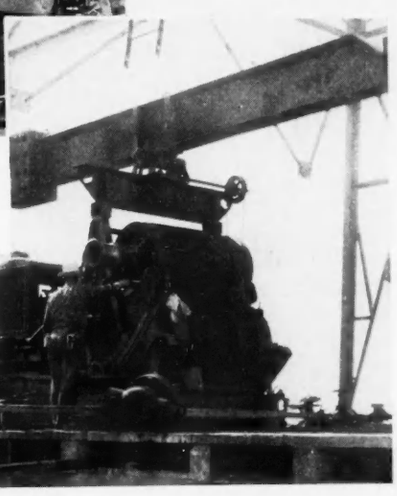
CONSTRUYEN EN TRES TAMANOS

DRILLING FORAGE PERFORACION

DOUBLE DRUM WITH SPUDDER
OUBLE TAMBOUR AVEC BEQUILLE
OR DOBLE CON MAQUINA SPUDDER DE CABLE LIVIANO



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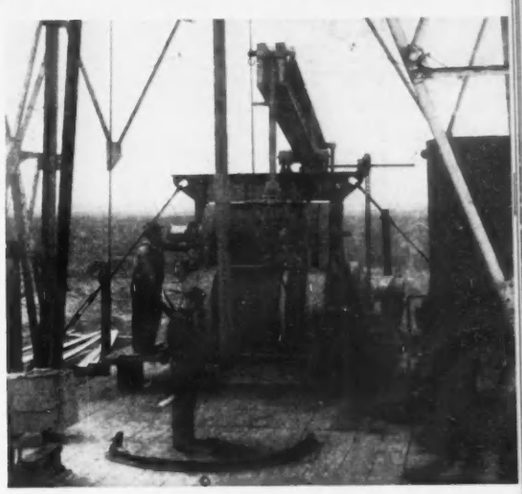

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pany's concession embracing this shut-in field covers an area of nearly 43,000 square miles, leaving plenty of room for future prospecting. As has been inferred, Qiayarah structure is similar in some respects to that of Kirkuk, only the general terrain is much more rugged. Visitors to the field say that derricks are conspicuous by their absence. All the wells will be flowing ones when opened, which will have to be the case late in 1939, according to terms of the concession.

The top of Qiayarah's producing horizon, a limestone, is found at depths ranging down to 2500 feet. Thickness of the productive section of the lime varies from 400 to 600 feet, it is said.

Operating Practices

So far it has not been the practice of the operating company to set a protective liner of any sort in the productive zone. The same is true of the practice at Kirkuk. It should be pointed out, however, that Qiayarah may not be as safe a field as Kirkuk to operate; water may be a bit troublesome in the new area where the beds are much less steep, or nearer level.

Two strings of cable tools are developing the main Qiayarah structure, although off the structure British Oil Development Company has two large Diesel powered rotaries. In January these rigs were pulling cores from 7⅝-inch hole from below 5000 feet. Other drilling equipment being used on the concession includes a light outfit for core drilling the structure, two portable cable rigs, and three small rotaries. In some instances locations on the structure (prospecting locations) are over 600 kilometers apart.

Kirkuk Wells Large

Kirkuk field, now supplying a flowing production of about 80,000 barrels per day, is still very much in the picture of Iraq oil. Forty-six wells have been drilled, although less than half that number are filling the pipe line. As a matter of interest, it has been stated that any one of several wells in Kirkuk field, by itself, could bulge the line, figuratively speaking, if called on to do so.

Although having some of the same contaminating elements as that of Qiayarah, such as sulphur, the Kirkuk oil in much lighter, running from 30 to 33 gravity. The structure, in excess of 50 miles in length, ranges from one to two miles in width. Only one dry hole has been drilled, and that one was off structure.

The concession of Iraq Petroleum Company on which Kirkuk is located contains about 35,000 square miles. Vegetation thereon is restricted largely to camel thorn. Most of the concession is made up of flat, hard baked clay lands and rock covered hills typified in spots by limestone outcrops. Production is from limestone found at depths ranging down to 3500 feet. The amount of this horizon taken in ranges from 400 to 1200 feet. The beds are steep, involving a small problem in maintaining a vertical hole.

Only one rotary rig is active, but experiments are being made with acid to determine its effect on initial and subsequent production. The field men in Kirkuk have not been introduced to water problems, and it looks as though they will not be for some time.

Colombia

[*Continued from page 162*]

shallow depths around La Petrolea, the drilling is fairly difficult, calling for hard formation bits most of the way down to pay lime. It has been found necessary to use a stuffing box and drill in under pressure prior to completion.

May Drill 50 Wells

At present Colombian Petroleum Company has 11 drillers on Barco concession. And although the native crew men have proved exceptionally adept at handling work on the derrick floor and around the boilers, it will be necessary to import a number of trained, experienced American drillers to carry out the 50-well campaign planned on the concession for 1938. Colombian authorities are expected to approve of this policy for several reasons. Among them are two outstanding: First, it behooves that government to do what it can to accelerate the date on which the government will begin collecting royalties on the crude oil produced on the Barco concession. Second, the more American drillers imported into Colombia for development of the nation's natural resources, the more native Colombians will be employed for work on the rigs. Hence, under the latter case, the more American drillers imported for "training masters," the sooner and greater the number of Colombians will be that actually are entrusted to handle the brake in getting the fullest value for their country out of crude petroleum reserves.

Crews have been working on Barco concession rigs three shifts. With the program there this year the heaviest it has ever been, the three-shift practice will be continued.

Inasmuch as Barco concession is in line to become one of the important foreign fields of 1939, if not by late in 1938, it is worthwhile to give here a few facts concerning it and those responsible for its development.

A Large Concession

The concession consists of 200,000 hectares. Of this, five tracts totaling about 70,000 hectares have been selected. The operating company has slightly less than four years to complete the selection of its choosings from the concession. In November, 1937, the concession had about 44 more years to run.

Barco concession is officially known as the Chaux-Folsom contract, which has the form of a national law. Terms of the concession provide that a pipe line must be built to a Colombian port when production thereon reaches 3000 metric tons, or about 23,000 barrels daily. This line will have to penetrate jungle country and go over a range of mountains, the lowest pass through which is estimated to have an altitude of about 5000 feet.

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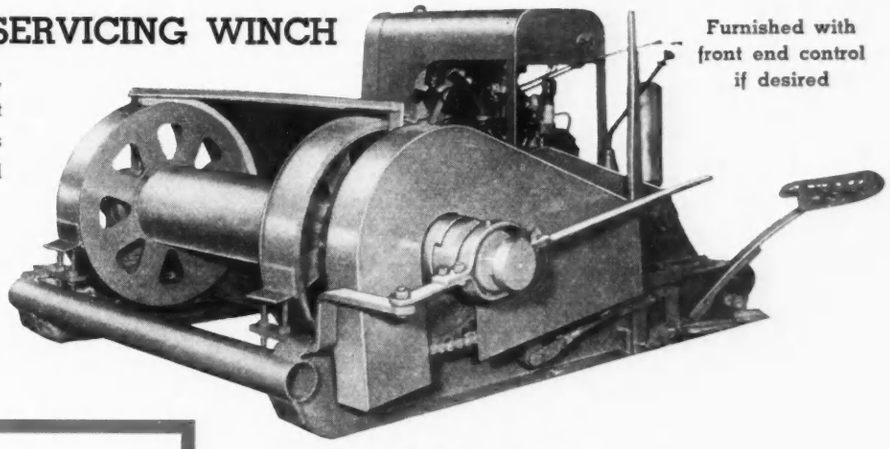

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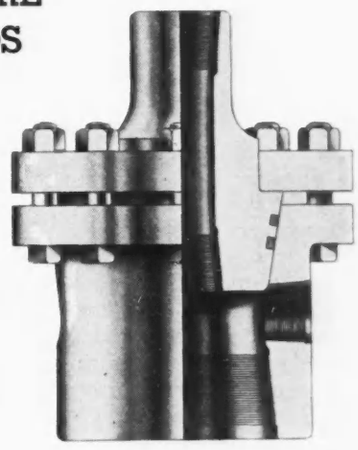

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France

Search in recent years has been productive of but small encouragement in France, but in her Colony of Morocco the work is more encouraging—in fact, a shipment has been received from there.

By N. V. PERVOUCHNE

In France, oil prospecting as it has been undertaken during recent years, has not given satisfactory results up to the present. A little better have been the results of prospecting in Morocco where insignificant oil-bearing formations have been discovered, principally in the district of Tselfat-Petitjean. In this district a small quantity of oil is yet produced: at the present time about 6000 tons (42,000 barrels) per annum.

The only oil field that is really under exploitation in France, is that of Pechelbronn which production is about 75,000 tons (245,000 barrels) yearly of crude oil. In the remainder of the country, only prospecting is carried on and principally in the south of France.

It should be noted that the French government has not given up the idea of discovering oil in France and in the French colonies. Considerable sums of money have been spent to this purpose. The budget for the year 1938, Chapter Mines, provides for 64 million francs of state grant to the Liquid Fuel State Board to be assigned to oil prospecting in France, in the colonies and in countries under French protectorate.

In France itself there is at present only one oil drilling in operation; that of Pezenas, in the Department of Herault, at Castelnau-de-Gers. The drilling was stopped at 2570 feet, as the coring drill became wedged in the well and it became necessary to deviate the drilling which reached its former level and now is being continued.

At 2500 feet, the drill struck into the Jurassic limestone in which impregnations of oil were observed.

It is expected that the Triassic or infra-Triassic horizons, likely to contain oil, will not be reached before 600-800 feet below the present level.

The neighborhood of the Gabian oil-bearing formations, the annual production of which is a steady several thousand barrels, is regarded as a favorable indication for the discovery of oil in this field. Also, the shales of Vagnas, Department of Ardeche, are not far off and maybe are prolonged as far as the Pezenas district. Further, the geological structure appears to be favorable to oil bearing on account of the faults of this field.

It now has been decided to begin drilling at Gornies, also in the Department of Herault. The first drilling will be made to a depth of 1300 to 2400 feet and the necessary means will be supplied by the Liquid Fuel State Board; this drilling will be done by the Societe De Hulster-Fabie.

The new drilling is situated to the north of Gabian. That is a zone with many faults and the Pyrenees decumbant folds contain numerous Triassic and infra-Liassi formations likely to contain oil. It is the lagoon-like character of these deposits which has given rise to the idea that they may be oil-bearing. The position of the new drilling is bordered on the one side by the bitumen neighboring with faults in the Department of Gard; these bitumens may have been brought there in Oligocene as rising hydrocarbon emanations from Trias. On the other side, there is the Balaruc with its sulphatic, bromide and biracic springs.

To conclude, it should be observed that the geophysical prospections by the seismograph method will soon be completed in this district. The Liquid Fuel State Board has just ordered several drilling rotary rigs. This purchase has been possible owing to a special credit of 28 millions francs assigned for it, under the Unemployed Contracting Program. These rigs will be used in the south and in the Pyrenees district and perhaps also in the Paris, as the city of Paris wishes to ascertain whether hot water springs are to be found at 7500 or 8000 feet depth. For this purpose the geological structure of the district will be studied.

First Importation of Moroccan Oil in France

The first shipment of 1000 tons (8000 barrels) of Moroccan crude oil reached LeHavre on November 5 by the tanker "ALGOL." This is a historical date in the annals of the French oil industry for never before had the Moroccan crude oil been brought to France. This oil will be subjected to trial tests at the Raffinerie de Normandie at Gonfreville.

The crude oil produced at Tselfat and Bou-Draa is sent by local pipe line to tank farm and from there is transported by trucks to the central storage tanks situated near the Pe-

[*Continued on page 180*]

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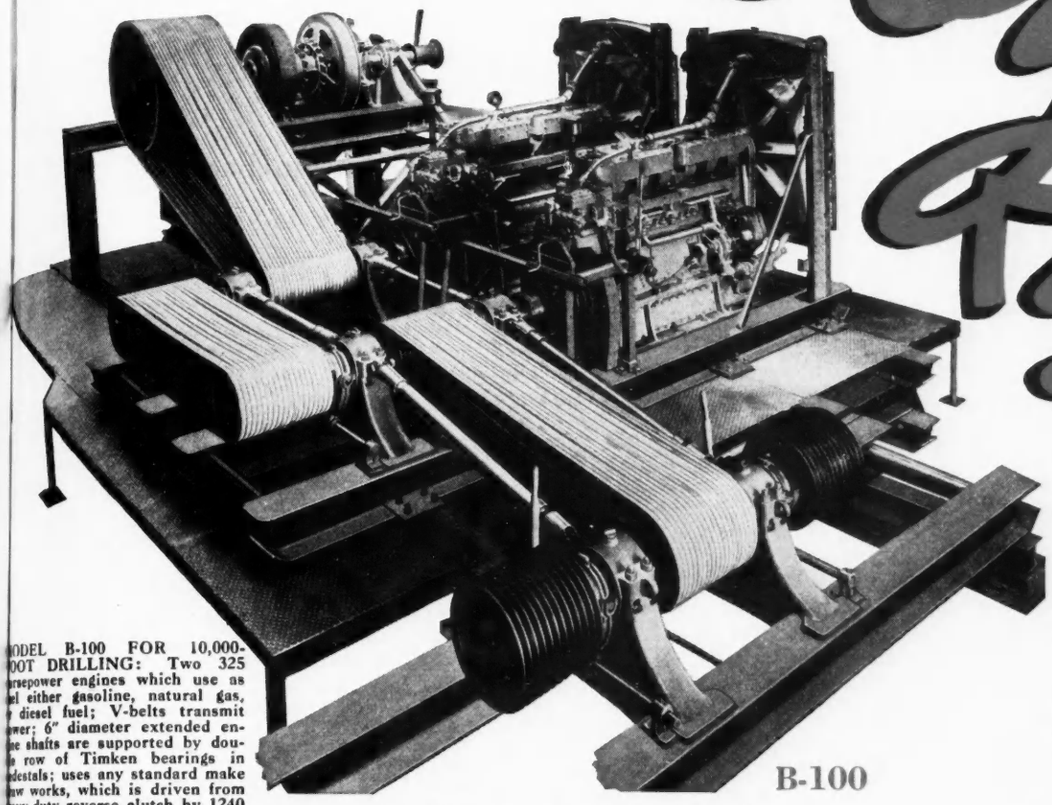
ara Perforacion de 7500 y 10.000 Pies

Portable Rigs



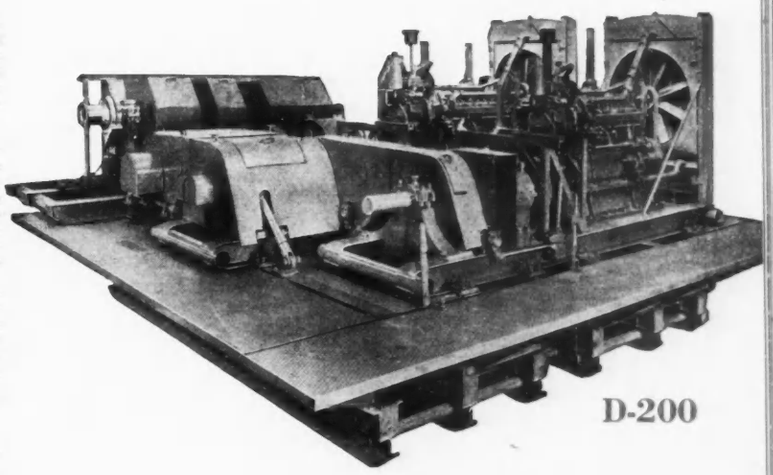
B-100

ODEL B-100 FOR 10,000-OOT DRILLING: Two 325 rsepower engines which use as el either gasoline, natural gas, diesel fuel; V-belts transmit wer; 6" diameter extended en-e shafts are supported by dou-e row of Timken bearings in destals; uses any standard make aw works, which is driven from avy-duty reverse clutch by 1240 ain from double sprocket; engine and reverse controls mounted at driller's position reverse clutch control operates similar to that of steam engine; furnished with any height bstructure and permits setting pumps on ground level; pulls either one or two pumps.
ODEL D-200 FOR 7,500-FOOT DRILLING: Two 225 horsepower engines with herring-ne reduction gears can be compounded into draw works or to pumps; uses any standard ke draw works; 3-speed reverse clutch (when used with 4-speed draw works, 12 speeds available); all drives are double width roller chain on cut tooth sprockets provided with p lubrication; all extended shafts mounted on double row Timken bearings in pedestals; gines and reverse clutch controls mounted at driller's position; any height substructure ired with provision for setting pumps on ground level.

Left—View showing drives to reverse clutches: compounding drive between engines and to double pump countershaft. Rig is set up on substructure with steel walkway.

A gauche—Vue où l'on voit les commandes aux embrayages de marche arrière; commande jumelée entre moteurs et au double arbre de renvoi de pompe. Groupe monté sur sous-structure avec un trottoir d'acier.

Izquierda—En esta vista se ven las transmisiones a los embragues de contramarcha; la transmisión coordinada entre los motores y derivada al contraje de la bomba doble. Todo el equipo está montado sobre una subestructura provista de pasillo de acero.



D-200

ODELE B-100 POUR FORAGE A 10.000 PIEDS: Deux moteurs de 325 H.P. qui emploi-t comme carburant soit l'essence, soit le gaz naturel, soit le carburant Diesel; énergie nsmise par courroies en V; vilebrequins prolongés au diamètre de 6 pouces et reposant r une double rangée de paliers Timken dans piédestaux; emploie toute marque standard de oupe de traction, qui est commandé par embrayage de renversement de marche de service r au moyen de chaîne 1240 sur double pignon; commandes de moteur et de renversement marche montées à la position de foreur, et la commande d'embrayage de marche arrière nctionne comme celle d'une machine à vapeur; fourni avec sous-structure de toute hauteur permet de poser les pompes au niveau du sol; traction d'une pompe ou deux.
ODELE D-200 POUR FORAGE A 7.500 PIEDS: Deux moteurs de 225 H.P. avec engre-es réducteurs à chevrons pouvant être montés en jumelé sur groupe de traction ou sur mpes; emploie toute marque standard de groupe de traction; embrayage de marche arrière 3 vitesses (quand sur groupe tracteur de 4 vitesses, on dispose de 12 vitesses); toutes commandes sont en chaîne à rouleaux de double largeur sur pignons à dents taillées et graissage à gouttes; tous les arbres prolongés sont montés sur double rangée de paliers mken dans piédestaux; commandes de moteur et d'embrayage de marche arrière montées à position de foreur; sous-structure de toute hauteur désirée et prévoyant la pose des mpes au niveau du sol.

Above—View showing location of each unit with high substructure and walkway around units. Strong steel guards over all drives insure safety and long life of chains.

Ci-dessus—Vue où l'on voit l'emplacement de chaque groupe avec haute sous-structure et trottoir autour des groupes. De forts garde-chaines d'acier au-dessus de toutes les commandes assurent la sécurité et un long usage aux chaines.

Arriba—En esta vista mostramos le colocación de cada grupo, habiendo alrededor de todos una subestructura alta provista de cómodo pasillo. Los firmes resguardos de acero encima de las transmisiones significan seguridad y mayor duración para las cadenas

ODELO B-100 PARA PERFORACION DE 10.000 PIES: Dos motores de 325 caballos de rza, que como combustible pueden emplear gasolina, gas natural o combustible de motor sel; transmisión de fuerza por correas en V; los árboles extendidos de los motores, de 6" de metro, están soportados en cojinetes Timken de doble hilera de rodillos, montados en pe-tales; utiliza cualquier modelo corriente de máquina de tracción, que sea accionado medi-e embrague de contramarcha de trabajo pesado, por cadena de 1240 y doble rueda dentada; gobiernos de los motores y contramarcha están al fácil alcance del operario y el gobierno del brague de contramarcha es similar en funcionamiento al de un motor de vapor; se suministra subestructira de cualquier altura; permite la instalación de las bombas al nivel del piso; uede acondicionar a una o dos bombas.
ODELO D-200 PARA PERFORACION DE 7500 PIES: Dos motores de 225 caballos de rza, con engranajes de reducción en espiguilla pueden coordinarse en la máquina o en las mbas; utiliza cualquier modelo corriente de máquina de tracción; embrague de contramarcha velocidades (cuando se emplea con máquina de 4 velocidades, habiendo también un modelo 12 velocidades); todas las transmisiones son por cadenas de rodillos de doble anchur, con das de dientes labrados a máquina y lubricación a goteo; todos los árboles sobresalientes n montados en cojinetes Timken de doble hilera de rodillos, montados en pedestales; los ernos de los motores y del embrague de contramarcha están al fácil alcance del operario a o; subestructura de cualquier altura, con provisión para la instalación de las bombas al el del piso.

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Egypt

Land of Pharaohs may stage comeback if intensity of exploratory work is sign.

IN 1934, or even 1937, for that matter, reference to Egypt as one of the oil producing countries of the world subconsciously brought about a mental characterization of one of the "also rans."

Up to the end of 1936, those who had not followed all the vicissitudes of the Egyptian government, and a good many who had, were inclined to believe that Egypt had seen its best days as a producer of crude oil.

The picture has changed along with the change in Egyptian politics and the victories of the Wafd party supporters. The result is that Egypt, a country recording a steadily declining production curve for several years, now looms, from the magnitude of exploratory work alone, as one of those rare cases where possibility of a comeback is imminent.

Many Concessions

Petroleum concessions for exploratory and exploitation purposes have been granted during the past twelve months to such outstanding international organizations as D'Arcy Exploration Company, Socony Vacuum Oil Company, Societe California Egyptienne des Petroles (Standard Oil Company of California), Standard Oil Company of Egypt (Standard Oil Company of New Jersey), Societe Texas Egyptienne des Petroles (The Texas Company), and Anglo-Egyptian Oilfields, Limited, the organization which has been producing crude at Hurghada field in Egypt for many years.

If the calibre of the concessionnaires in Egypt was not what it is, the oil industry might be justified in assuming that the present exploratory campaign might be just another flash in the pan. But with organizations of the type of those who have gone to the trouble to obtain concessions active in the efforts to open new crude oil reserves, we can, if history repeats itself, be more or less justified in the opinion that Egypt of 1938 is destined to receive a more thorough and complete test for new reservoirs than it has ever been subjected to before.

The foregoing point is substantiated in effect when attention is called to the fact that Shell interests, Anglo-Iranian Oil Company interests and Standard Oil interests of America are involved in the competitive search, in addition to The Texas Company, an organization which has made its presence felt in international oil, particularly in the Near and Far East, for several years.

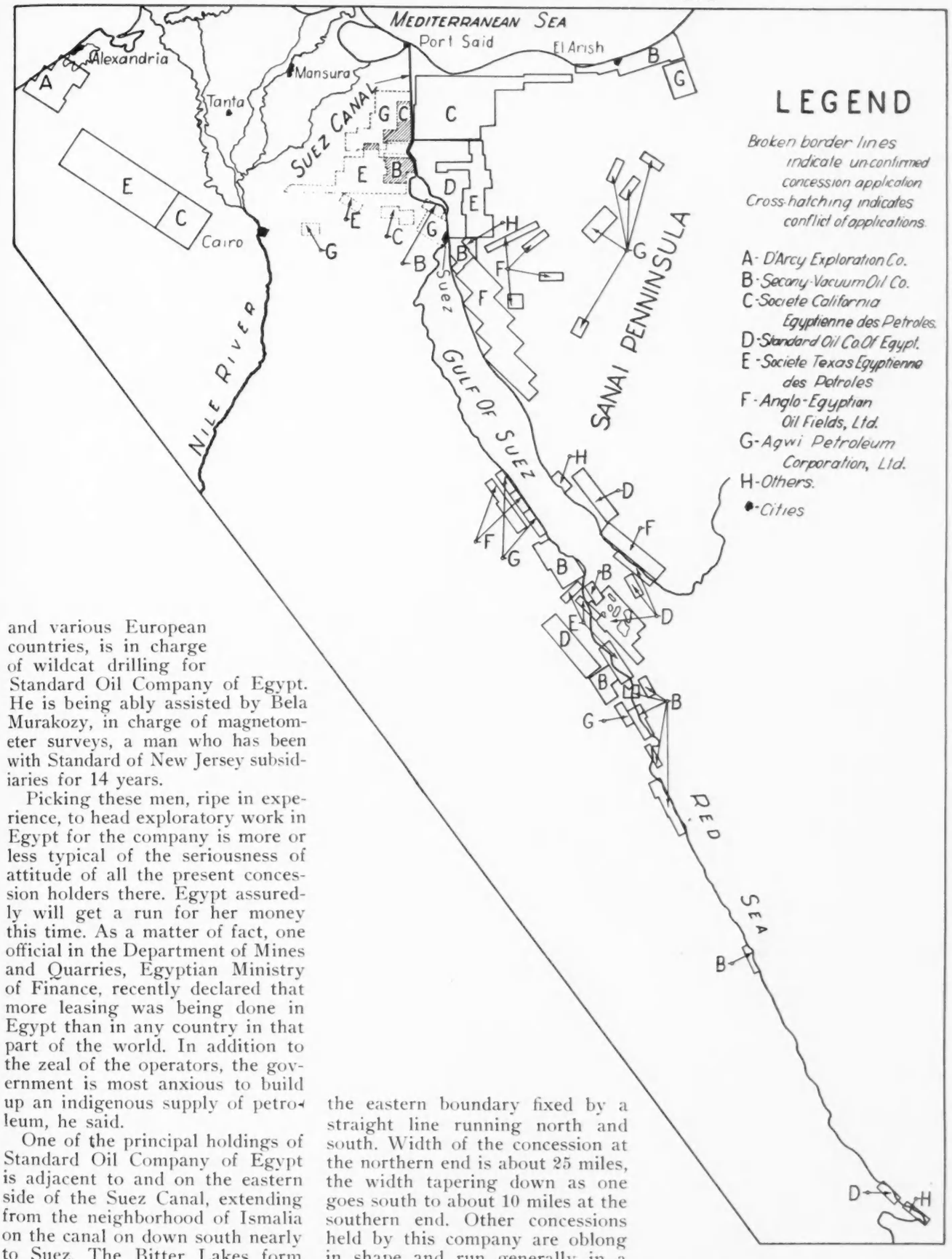
Conservative English trade paper opinion is that the influx of new wildcatters to develop whatever Egypt may have in the way of new oil fields is due to recent legislation. Those looking at the matter from another viewpoint see in the new laws merely a culmination of resentment to "uninvited" British in Egypt dating back beyond the days of Allenby in the World War, but aggravated by accomplishments of his brilliant military career there. Mussolini's covetous attitude toward Ethiopia undoubtedly was responsible for the agreeableness in English political circles to the proposal that steps be taken to make Egypt more of an ally in times of war or national emergency than a not-necessarily-patriotic protectorate. Hence the new legislation, due to the power and popularity of the Wafdists in their fight against outside control of Egypt, resulted in two things: an assurance of military and related types of support in times of war for England, and assurance of healthy competition in development of her crude reserves for Egypt.

The accompanying map will give a rough idea of where principal concessions are held in the Land of the Pharaohs.

Geophysical Work

Now, with respect to current operations in Egypt, Standard Oil Company of Egypt has secured a maximum amount of permits, and early in 1938 was conducting magnetometer and geological surveys on its concessions. It is said to be the opinion of some members of Standard's staff in Egypt that better results might have been obtained in the old days had rotary been called into use sooner. But, of course, this is a matter of opinion only. W. M. Small, who has handled exploitation work for Jersey interests in Mexico, Argentina,

Map Showing Concessions Granted in Egypt



and various European countries, is in charge of wildcat drilling for Standard Oil Company of Egypt. He is being ably assisted by Bela Murakozy, in charge of magnetometer surveys, a man who has been with Standard of New Jersey subsidiaries for 14 years.

Picking these men, ripe in experience, to head exploratory work in Egypt for the company is more or less typical of the seriousness of attitude of all the present concession holders there. Egypt assuredly will get a run for her money this time. As a matter of fact, one official in the Department of Mines and Quarries, Egyptian Ministry of Finance, recently declared that more leasing was being done in Egypt than in any country in that part of the world. In addition to the zeal of the operators, the government is most anxious to build up an indigenous supply of petroleum, he said.

One of the principal holdings of Standard Oil Company of Egypt is adjacent to and on the eastern side of the Suez Canal, extending from the neighborhood of Ismalia on the canal on down south nearly to Suez. The Bitter Lakes form part of the western boundary to this concession. The north and south boundaries are parallel, with the eastern boundary fixed by a straight line running north and south. Width of the concession at the northern end is about 25 miles, the width tapering down as one goes south to about 10 miles at the southern end. Other concessions held by this company are oblong in shape and run generally in a northwest-southeast direction. One is about five miles inland from the western shore of the Sinai Peninsula, the lower end of it being about 40 miles northwest of the southern tip of that peninsula. It is

about 35 miles long. Then, too, the company holds concessions on some islands in the Gulf of Suez west of the southern tip of the peninsula and north of Egypt's Hurghada oil field. Near the southern end of Egypt on the coast of the Red Sea, some 15 miles southeast of Gulhan Islands, the company has another small concession.

Anglo-Egyptian Oilfields, Limited, which for years has had the only commercial production in Egypt, that obtained from Hurghada, a field nearing depletion, has joined the brigade of wildcatters, listing a concession bordering the western shore of the Sinai Peninsula along the northern end of the Gulf of Suez on its eastern shore, and four smaller concessions located from 1 to 20 miles inland on the peninsula from the eastern border of the former concession. This organization also has another concession about 75 miles north of the south end of the peninsula, it being located on the western shore thereof and between the shore and a larger concession held by Standard Oil Company of Egypt. Then, starting at a point about 15 miles north of the southern tip of the peninsula and running north along the eastern shore of the gulf, Anglo-Egyptian holds another concession. North of Hurghada, and on the western shore of the Red Sea, the company holds still another concession. It has already started an exploratory test on the Egyptian side of the Gulf of Suez on a concession centering around Ras Ghareb, which is about midway between Suez and Hurghada field.

Hurghada Field

Hurghada field, by the way, at last reports was producing at the rate of about 175,000 tons per year. It has an area of 1050 acres and had produced 4,161,400 tons to the end of 1936. As considerable of the currently planned exploratory drilling is slated to take place in the vicinity of Hurghada, something of the history of the field will be of interest to those following Egyptian developments. Hurghada is 180 miles south of Suez on the western shore of the Red Sea. It is sometimes referred to by natives as "Rarquada." Observation of limestone smelling like oil caused the first drilling, with the result that the discovery well, Anglo-Egyptian Oil Company's No. 1, was completed in October of 1914 at 1688 feet with an initial production of 1500 tons of oil having a specific gravity of 0.917. The field has been described as an anticline, with faulting as an important feature—a reflected buried hill of granite. Oil is found only in the western of two parallel surface anticlines.

Producing formations at Hurghada are soft sands and sandy shales of the Cretaceous, found at from 1400 to 2000 feet and yielding a mixed base oil of about 0.92 specific gravity.

Other Fields

To other Egyptian fields, of no importance commercially today, should be mentioned for whatever bearing they might have on future developments. One is Abu Durba, located on the western shore of the Sinai Peninsula. The Egyptian government found this field in 1918 when a well was completed at 172 feet. The field later passed into the hands of Anglo-Egyptian Oilfields, Limited, but the individual well yield was so small as to render the area unattractive, even as a shallow proposition. To the end of 1930 cumulative production of the field was only 7069 tons, notwithstanding the fact that early in 1931 there were 15 wells on production there. There was no development in the field in 1936, and nothing has been reported for 1937.

The other field is Gemsah, on a peninsula halfway between the axes of the Zeit range and the range of mountains to the west. It is 14 miles south of Gebel Zeit and on the west coast of the Red Sea. De Bay, having observed seepages, drilled Gemsah's first well to 196 feet in 1886. Prior to obtaining the first commercial production in 1909 at 1284 feet, two Americans drilled wildcats there, one getting 25 barrels of 23 Beaume gravity oil at 425 feet, the other getting showings of oil at 1310 feet and at 2000-12 feet. Gemsah is on a buried granite hill which is reflected in the surface structure, an exposed anticline. Oil is confined to a narrow belt east of the axis and along the shore. While oil was produced in the early days of the field from 425 feet, 1284 feet and 1610 feet, in later years the production was restricted to formations found between 1610 feet and 2100 feet, the oil being 39.5 gravity and coming from coral reef dolomite. Gemsah's peak was in 1914, when production totaled 88,000 tons, about 616,000 barrels. By 1926 the field's production had dropped to 250 barrels per day, and production had practically ceased in 1930 when Anglo-Egyptian was faced with water intrusion. The cumulative production of the field is said to be less than 200,000 tons.

To Drill Soon

At the close of the year, Socony Vacuum Oil Company was slated to be the first of American interests to get a wildcat underway in Egypt in 1938. In January finishing touches were being put to the camp for a crew to drill the first test on a location about 30 kilometers north of Hurghada. Resident officials of Socony Vacuum were considering in December the advisability of erecting at nearby Gemsah a pier for a base of operations.

Socony Vacuum, already a most aggressive marketer of petroleum products in Egypt, as well as in other spots of the Far and Near East, has done very well with respect to obtaining its share of concessions. And some who remember M. V. Anderson, the resident manager in Egypt, when he was busy as a geologist trekking the hills around Coalinga, California, several years ago, seem to think Soconoy Vacuum will miss few bets, if any, on those concessions. H. M. Lytell, in charge of field operations, also hails from California, having been with General Petroleum Corporation there in Santa Fe Springs and Bakersfield. He has seen foreign service in Germany. Temporarily headquartered in Cairo, he was expected shortly after the first of the year to spend most of his time at the location 540 kilometers to the south on the shore of the Red Sea.

Concessions of Socony Vacuum consist mainly of six blocks. The first centers around El Arish, east of Port Said on the Mediterranean Sea. The others are lower down on the western shore of the Gulf of Suez and of the Red Sea, extending as far south as Mersa Imbarak. It is said one of the sites chosen for drilling by this concern is located at Dishel el Daba, directly north of Safaga Island.

Societe Texas Egyptienne des Petroles, The Texas Company's subsidiary in Egypt, has an inland concession in the northwestern part of Sinai Peninsula. It is bounded on the west by the large concession of Standard Oil Company of Egypt which borders the

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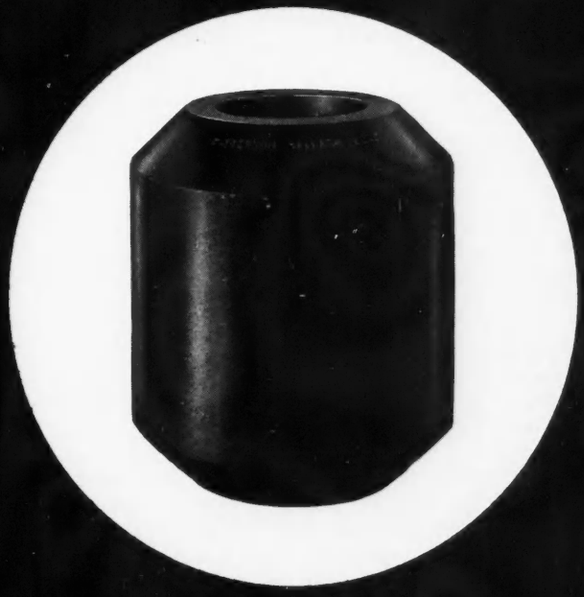

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Suez Canal and the western boundary of which follows the canal route from a point just north of Ismailia down to Suez. The Texas Egyptienne concession has the same north and south length as that of the adjacent Standard of Egypt concession. To the north of the Texas Egyptienne concession lies one belonging to Societe California Egyptienne des Petroles, while to the south are holdings of Anglo Egyptian Oilfields, Limited. Societe Texas Egyptienne des Petroles and Societe California Egyptienne, through the instrumentality of R. G. Wedemeyer, have applied for the maximum number of concessions and will definitely be in the wildcatting picture during 1938. The Texas organization, in addition to the Sinai holdings mentioned, has a large concession west of the Nile River. The northern tip of it is about 35 miles south of Alexandria. From that point it runs as a rectangle nearly 60 miles southeast, the width of the rectangle being roughly 20 miles. Adjacent to and at the southeastern end of this concession is one held by the California interests. In the event of a structure common to both the latter concessions, it may be logical to anticipate unit development by either one of the companies, as recent developments have shown a tendency for these two to "pool their bets" in the Near East, as was done at Bahrein. Recent maps of the leasing along the western shore of the Red Sea, as well as along the western shore of the Gulf of Suez to the north do not show any takings by the California or Texas organizations.

Large Concession

D'Arcy Exploration Company, representing Anglo Iranian interests in Egypt, holds one of the largest concessions on record in that country. It runs in a northwest-southeast direction from a point about five miles south of Alexandria on the Mediterranean Sea down to within about 30 miles of Cairo, all of the concession being west of the western fork of the Nile River. And D'Arcy Exploration Company, it will be remembered, has made some very valuable contributions in the past to the crude reserves of Anglo-Iranian Oil Company, Limited, the organization which has to its credit practically all the commercial production of Iran.

One other concessionaire should be mentioned: Zakki Bey Wissa. The holding is a relatively small one on the western coastline of Sinai Peninsula some 70 miles north of the southern tip of the peninsula and about two miles west of a much larger concession held by Standard Oil Company of Egypt. Sakki Bey Wissa operated at Abu Durba for a number of years.

From the foregoing it will be noted that much of the projected wildcat play will take place along the western shore of the Red Sea or along the shores of the Gulf of Suez. From the market outlet angle, this would result in a "natural," as the sports writers say. For the Suez Canal and the Gulf of Suez both are parts of one of the most heavily traveled tanker lanes in the world. Crude from Iran, Bahrein, Iraq and the Dutch East Indies, and some from other places too, is routed through the canal. As for the inland concessions in Egypt proper and on the Sinai Peninsula, no noteworthy oil transportation problems are anticipated.

Egypt has been growing steadily in the past years, having recorded an increase of 35 percent in population during the past 30 years. Its population today is said to be in excess of 18,000,000. Local consumption of petroleum products has been growing rapidly there also, kerosene being the product in greatest demand. In the interior it is used extensively for lighting, electric lighting being restricted to the larger cities and larger provincial towns. It is also used extensively for cooking in Egypt. Coal and wood must be imported and are expensive.

Anglo-Egyptian Oilfields, Limited, has a refinery at Suez rated at about 500,000 metric tons annually, considerably more oil than the company is producing at Hurghada. The government's refinery at the same place, modernized in 1936, is rated at 50,000 metric tons annually. Combined capacities of the two are not sufficient to take care of domestic needs. And hence, development of worthwhile production from current and planned wildcatting probably will entail erection of additional refining capacity. With the exception of the last concessionaire, that is, Sakki Bey Wissa, all the companies holding concessions are subsidiaries of integrated firms already operating refineries elsewhere throughout the world.

France

[*Continued from page 170*]

titjean railway station. There it is pumped into tank cars and sent to Port-Lyautay where the Societe Cherifienne des Petroles has hired a tank of 1500 cubic meters capacity.

In a recent statement to the press, Mr. Ramadier, Under Secretary of State for Mines and Liquid Fuels, said in connection with oil prospecting in Morocco:

"Morocco has deceived many delusions resulting from exaggerated statements wildly spread out; but it has encouraged serious prospectors who well know that a great effort must be applied sometimes for small results. Bou-Draa and Tselfat produce at present 6000 tons per annum.

Prospecting in the Other Colonies

Oil prospecting is also being carried on in some other colonies.

In Tunisia, prospecting is being pushed actively. Last year it resulted in a flow of natural gas which was unfortunately brought to an end by a drilling accident. In the Gabon, first prospecting works have been carried out, but they do not go beyond the stage of geological studies. In Madagascar, an expedition is doing drilling operations with varying success.

Madagascar is worthy of special mention.

A decree which appeared in the French government's Journal Officiel of November 7 confirmed the agreement between the Madagascar colony, the Liquid Fuel State Board and Compagnie Francaise des Petroles on July 20, 1937, for search of oil and authorized this colony to expend 4,500,000 francs for it.

It should be noted that up to the present, three drillings have been undertaken in Madagascar, two in the district of Andrafiavelo which were stopped at a depth of 400 meters because plutonic rocks were met with, and one near Folokara which at a depth of 900 meters had met two oil horizons.

Lastly, the Societe Pechelbronn, of Strasbourg, will in future participate in the search for oil in the French colonies, together with Compagnie Francaise des Petroles and the Liquid Fuel Board.

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Japan

The past year's development resulted in an increase of 10 percent in crude oil production; interest now is turning to deeper drilling and a hole has been drilled to 11,000 feet.

By KOSAKU UYENO
General Manager
Production and Drilling Department
Nippon Oil Company

PRODUCTION of crude oil in Japan showed an increase of about 10 percent in 1937 over that produced in 1936. [Japan was accredited with a yield of 3,820,426 hectoliters in 1936, which would bring the 1937 total up to about 4,202,508 hectoliters in 1937.]

Yabase field, discovered in 1935 near Akita City, was the most active in Japan proper during 1937. During the period under review it was extended 12,000 feet south by completion of Nippon Kogyo Company's Araya 1 at 660 feet for an initial production of 50 barrels per day.

Another important development at Yabase field during the year was discovery of a new deep sand slightly below 1000 feet, with the result that a number of wells currently producing from the upper sand will be deepened to the new sand during 1938. To date, the best well completed in the deep sand is Nippon Oil Company's No. 16, a cable tool project that initialled 600 barrels daily when deepened from 1033 to 1042 feet.

Of the total of 74 completions in Yabase field, about 50 wells have been completed by Nippon Oil Company and the remainder by Nippon Kogyo Company.

A new field south of Oguni oil field has been indicated by Nippon Oil Company's Katsurazaka 5, a wildcat about 20 miles south of Akita City. With bottom at 3073 feet, the wildcat produced 50 barrels of 27 Beaume gravity oil daily. Rig has been set up for drilling Katsurazaka 6 as soon as possible.

Second in importance among Japanese wildcats during 1937 was the same company's No. 2, a cable tool proposition drilled to 1390 feet in Yamagata Province. While completion of No. 2 was non-commercial, its yield being only 10 barrels daily of 10 Beaume gravity heavy crude, its importance rests in the fact that it is located high up in the mountain area at the foot of Chyokai Volcano in a neighborhood having many oil seepages. That it may hold considerable promise in the future is indicated as a possibility by action of Nippon Oil Company in moving in a rig for Rotary 1 and making location for Cable 3.

Japanese petroleum engineers are showing keen interest in progress of the deepest hole in the nation, Nippon Oil Company's Kinsui 32, Kinsui field in Taiwan (Formosa) island. After having drilled to 11,502 feet, the drill pipe froze, with the result that the close of the year found the crew endeavoring to recover the 3½-inch stem. This deep test on Formosa, which probably rates also as the deepest in all of the Far East, has recorded several oil and gas sands below 10,000 feet. After recovering the lost drill stem, more hole will be made, as geological opinion in Japan is that a prolific deeper sand underlies a large part of that portion of Kinsui field already proven for commercial gas production at upper levels.

While 11,502 feet may not seem deep to producers in the United States of America, attaining such depths in the Orient is little short of sensational. And for that reason it is considered worthwhile, as a matter of record, to give here the casing record of Kinsui 32.

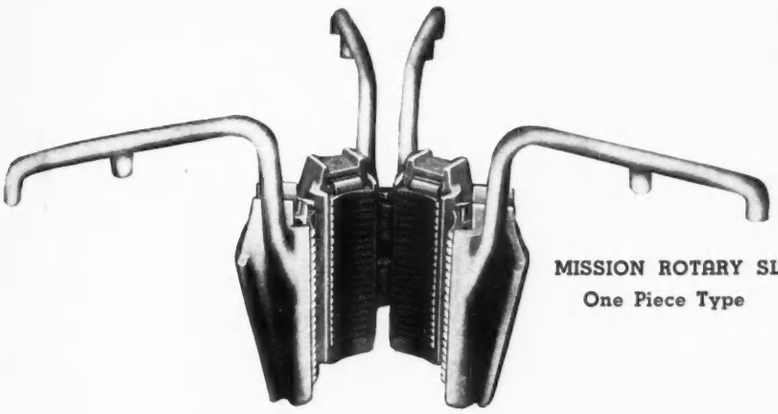
A string of 16-inch casing, 84-pound, was cemented at 3457 feet. Then 11¾-inch, 60-pound casing was cemented at 5777 feet. This was followed by a string of 8⅝-inch, cemented at 8088 feet. The final string was 6⅝-inch casing, cemented at 10,485 feet. The latter was 28-pound material.

In the southern part of Taiwan island, or Formosa, Nippon Oil Company is developing two gas fields: Gyuzan and Rokujyukei, located about seven miles apart. Midway between these two fields, the company has built two units of carbon black plants, each of which has a capacity of about 2,500,000 cubic feet of gas in manufacturing about 4000 pounds of carbon black each day. Just across from the carbon black plants the company has erected a gasoline absorption plant having a capacity of handling 30,000,000 cubic feet of gas.

Pipe line construction called for to put the plants in operation involved two miles of 10-inch line in the southern part of the area embracing the two gas fields and five miles of 6⅝-inch line in the northern part. The former line connects with Gyuzan and the latter with Rokujukei field.

One unit of the carbon black

[*Continued on page 192*]



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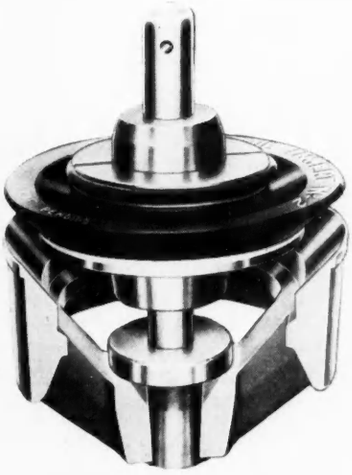

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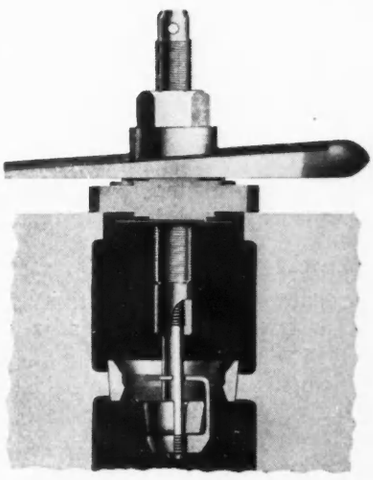

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Roumania

For the first time in 20 years the country's output shows a decline, and this despite marked advances in operating methods in line with the rest of the world.

THE oil industry in Roumania during 1937 continued the advances technically and economically that have characterized its evolution during the past few years. Exploitation has been made as rational as possible, introducing improvements and inovations from other countries, especially the United States of America, where also this year the larger companies have sent young engineers to study in refineries the continuation of improvements.

For the first time since the War, crude oil production shows a decrease in comparison with the previous year. Production in 1937 approximates 7,200,000 tons, against 8,704,000 tons in 1936, a loss of 1,504,000 tons, or 18 percent. Record for production (in tons) for the last 10 years is as follows:

1928	4,268,500
1929	4,827,300
1930	5,744,000
1931	6,657,800
1932	7,350,300
1933	7,387,000
1934	8,473,300
1935	8,394,000
1936	8,704,000
1937	7,200,000

Drilling, on the other hand, was more active in 1937 as compared with 1936, comparative figures being 387,000 meters drilled in 1937 and 329,000 meters in 1936, a gain of 68,000 meters, or 20 percent. The record of drilling during the last 10 years (in meters) is as follows:

1928	246,800
1929	312,800
1930	284,000
1931	139,200
1932	208,400
1933	253,200
1934	377,000
1935	312,500
1936	329,000
1937	387,000

Decrease in 1937 production is due mainly to the Bucshani field, where the yield dropped to 1,056,000 tons, a loss of 46 percent from its 2,176,500 tons the previous year. Drilling in this field was even more drastically curtailed, new hole for the year being only 48,000 meters as compared to 139,500 meters the previous year. Wells completed in 1937 were far from satisfactory and those drilled in 1936 have not held up. The complicated structure of the region has been assigned as the reason for this condition.

Rapid decrease in this field has led to more extensive wildcat activity, much of which is in territory adjacent to present production.

Developments in Roumanian fields during the year included:

District of Dambovitza

Gura Ocnitzei. This oil field was first, though production decreased 20 percent from the previous year—1,509,000 tons against 1,895,000 tons in 1936. Drilling was 47,000 meters, a substantial gain from 23,450 meters drilled in 1936. Most of the recovery in this field is by gas lift; Concordia Company, which controls 60 percent of the operation, has a modern central compressor system as well as a 42 kilometer pipe line for handling the gas. Total wells on production is 275.

Bucshani. Exploitation of this field is by a syndicate of interested companies. Provision of the mining law permitting such collaboration provides keeping of daily records of gas/oil ratios and bottom-hole pressure measurement to conserve gas pressure. However, as was said above, production here has so decreased as to influence a drop for all of Roumania. At the end of the year 110 wells were on production. During 1937 completions numbered 37. This field was discovered in November, 1934.

Developments in other fields in the district—Ochiuri, Razvad, Teis, Aninoasa and Viforata—had no important developments during the year. These fields are in fact continuation of Gura Ocnitzei. At Ochiuri 15 shallow wells were drilled, and the other sections named have confined activity to operation of existing producers. Four tests were drilled in the region of Comishani-Lazuri without results, as was one at Sutza-Seaca.

District of Prahove-Boldeshti

Boldeshti. This field, second largest in production, has the largest number of deep wells in Roumania, and is the most economical and up-to-date. The deepest well drilled in 1937 was completed at a depth of 2762 meters, being drilled and made ready for production in 135 days. Sixteen wells have been drilled, some showing satisfactory production, as f.i. No. 128 of Astra Romana with 235 tons. There was a slight decrease in production, the 1937 total being 1,360,000 tons against 1,405,200 tons in

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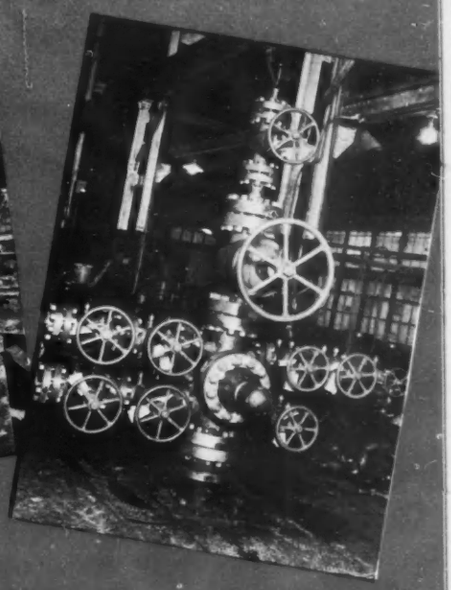
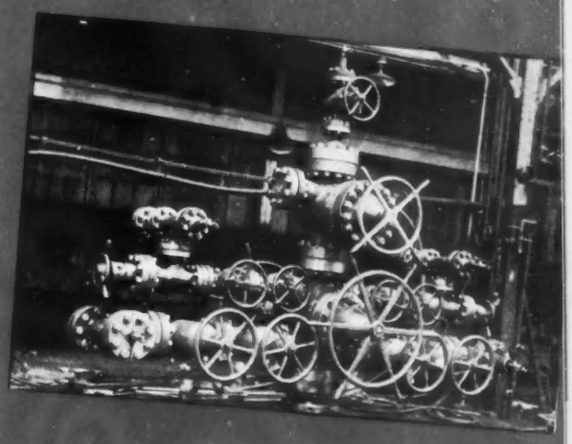
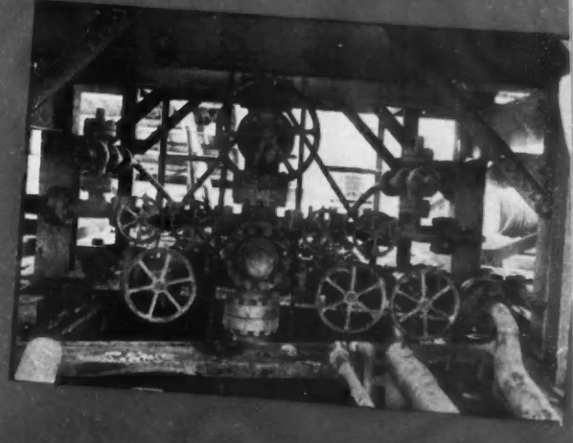
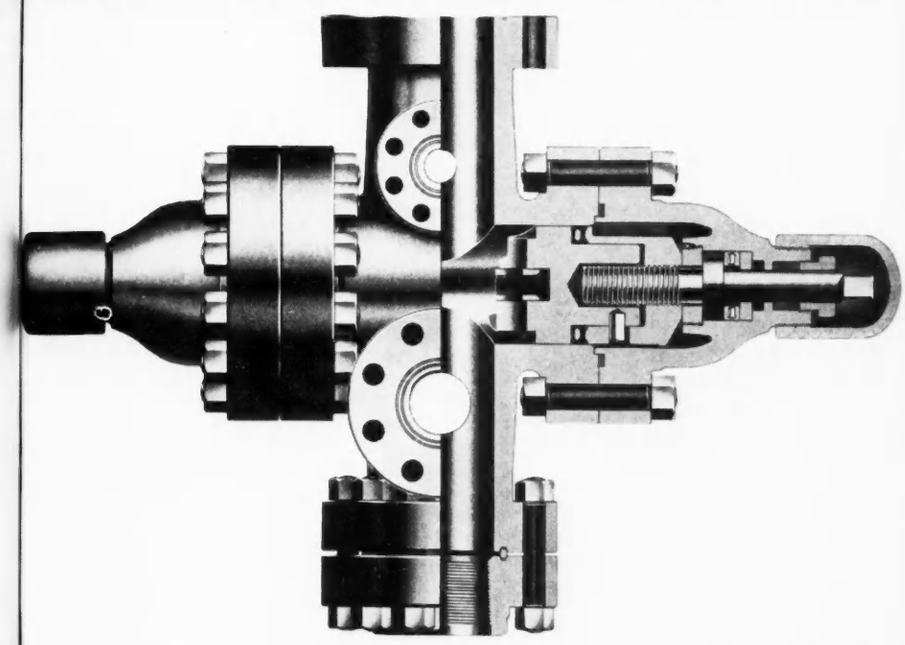






ameron Type 6-MR 6000 and 10,000 Lbs. Test Man- ally Operated Blowout Preventer and Control Head



The Cameron Type 6-MR Manually Operated Preventer is being accepted pidly as the master foundation for high pressure Xmas Trees. The illustra- ns herewith show typical Trees which have been furnished recently by s Company to the specifications of prominent major and independent erators.

Using the Type 6-MR Control Head above the casing head, well is vered completely at every stage of drilling-in and completion routine, re- rdless of whether liner and screen are run on the drill pipe or tubing.

Operators contemplating the drilling of high pressure wells in 1938 are ited to request, without obligation, full and complete details concerning e Type 6-MR Control Head and the various types of drilling-in and com- tion hook-ups which are in widespread use today in high pressure areas.

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1936. By putting into production well 38 Pauleshti, the producing zone of Boldeshti region was greatly extended. This well came in on August 9, 1937, yielding 460 tons on a 24-millimeter flow bean and is averaging 130 tons daily, using a 5-inch perforated liner. Fourteen-inch is set at 140 meters and 8½-inch at 1906 meters.

Moreni. More important drilling activity was developed in 1937, in comparison with that of the previous five years, when the oil companies only extracted crude oil from old productive wells. Sixty-two thousand meters were drilled in 1937 as against 4000 meters in 1932 and 10,000 meters in 1936. The activity was concentrated in Bana where 20 wells were drilled by Creditul Minier and Astra Romana. In Ghirdovani (south of Moreni) Romano Americana has drilled 10 wells on the state's perimeters and at Sangeris (north of Moreni) 3 exploration wells for the extension of the productive area. In 1937 820,000 tons of crude oil were produced as against 738,000 tons in 1936, an increase of approximately 10 percent.

Piscuri. This field, located in the eastern part of the extension of the Moreni field, had a production of 557,000 tons in 1937 against 510,000 tons in 1936 and 34,500 meters drilled in 1937 against 20,460 meters in 1936. The deepest of the 13 new wells is 1987 meters and is operated by gas-lift, the gas being brought 10 kilometers through the pipe line from Margineni.

Captura. After a few years' inactivity, 10 wells were brought in during 1937, one of which belongs to Steaua Romana Company with a production of 100 tons per day. Steaua Romana, Astra Romana, Creditul Minier and Romano Americana are the companies operating in Captura. The production in 1937 was 318,000 tons against 321,000 tons in 1936. The drilling totaled 17,600 meters in 1937. No drilling was done in 1936.

Tzintea. Operations of Phoenix Oil Company on the northeast section of the area have made this field of outstanding importance. A complex of sands mixed with crude oil under initial pressure of 138 atmospheres with an initial production of 335 tons, produced 200 tons daily. Intense activity is being carried on at present by Unirea, Colombia, Astra Romana and Concordia. In the old oil fields where in the past the activity was limited to exploitation of existing productive wells, 9 very deep wells have been drilled, for exploitation of the second dacian zone. The deepest well here was No. 407, producing at 2410 meters. Total production for the field was 139,000 tons in 1937 against 41,200 tons in 1936, and drilling totaled 42,000 meters against 4400 meters in 1936.

Filipeshti. The Astra Romana Company, which has operated here since 1910, drilled 5 new wells between 1000-2258 meters. One well has an established production of 80 tons daily. The production for the field was 77,000 tons in 1937. In 1936, 71,000 tons were produced. There were 6000 meters drilled in 1937 against 2000 meters in 1936.

Margineni. The exploitation of this young oil field is made with great care. The field was begun in 1936 and in these 2 years Astra Romana has drilled 5 wells, 2 of which are producing. Creditul Minier has drilled 4 wells, 1 producing oil and the other 3 gas. Redeventza has drilled 3 wells, 2 having average production, the third striking salt water. The wells had a large gas/oil ratio, causing considerable lowering of the gas pressure, and all attempts made to regulate this to a normal figure have been unsuccessful. In an interval of 13 months from the first well the pressure of the zone has been reduced from 160 to 110 atmospheres on the south and from 135 to 82 atmospheres on the north. To September 1, 1937, 47,000 tons of crude oil had been produced from the entire field and approximately 90,000,000 cubic centimeters of gas. In order to make an economical and rational use of this gas, Redeventza has installed a plant for extracting benzine from it (by polymerization), with a capacity of 15,000,000 cubic centimeters monthly, being able to recover 600 tons of gasoline and 1,500,000 liters of liquid gas. The dry gas is used for gas-lift in the Piscuri region, which is located 8 kilometers from Margineni, and a part is recompressed and returned to the crude oil zone.

Lilieshti. Exploration was begun in this region, situated between Tzintea and Baicoi, in 1929 by the Concordia Company. In 1932 they drilled 2 wells, at depths of 1751 and 2135 meters, and in 1936 these tests were retaken in order to obtain production by perforating at the higher strata at 501-540 meters and 556-558 meters, these being under a strata of salt. Two large wells have been drilled, one of which was abandoned at 500 meters. The other one, No. 4, begun on September 9, 1937, struck the first productive strata at 2417 meters with a production of 120 tons per day, later increased to 270 tons per day. It is interesting to note that the well has been drilled uncased from 140 to 2565 meters, a length of 2425 meters, the only guide pipe of 16 inches being fixed at 140 meters. Lilieshti region promises good results for 1938.

Scaioshi. At the end of November, an exploration well drilled by Creditul Minier Company, at a depth of 540 meters had reached a zone with a production of 15 tons daily. Important possibilities are open for 1938.

In the other fields such as Baicoi, Bushenari, Runcu, etc., there is no important new development, only the production, as economically as possible, of crude oil from the active wells.

In the district of Prahova the following exploration works have been done:

Manshti. Four exploration wells have been drilled in various points for determining the geological structure of drilling—Romano Americana at 1969 meters, Steaua Romana at 2061 meters and Phoenix Oil, two wells, at 1800 meters each. The one belonging to Romano Americana produces gas. Exploration work will continue this year.

Schiau. (Valea Calugareasca). Romano Americana drilled two wells here, to depths of 1908 and 1365 meters, which were dry holes.

Vertila-Racova. The exploration well of neo-Petrol Company, drilled by Phoenix Oil Group, was abandoned as dry at 2400 meters.

Floreshti. Romano Americana, although meeting with various difficulties on account of formations, is continuing the drilling of an exploration well, which is now at a depth of 1739 meters, and has been redrilled to 1610 meters.

The District of Buzau. No drilling has been done at Arganoshi, the only important place of this district and no exploration work was done in the district. Approximately 48,000 tons of crude oil were produced from wells belonging to Steaua Romana, Romano-Belginia de Petrol and Colombia.

The District of Bacau. This district, including 8 oil fields, has 164 old productive wells and 114 hand pumps, with a total production of 48,000 tons last year. The depth is 1600 meters at 2 wells. An exploratory well is being drilled by Steaua

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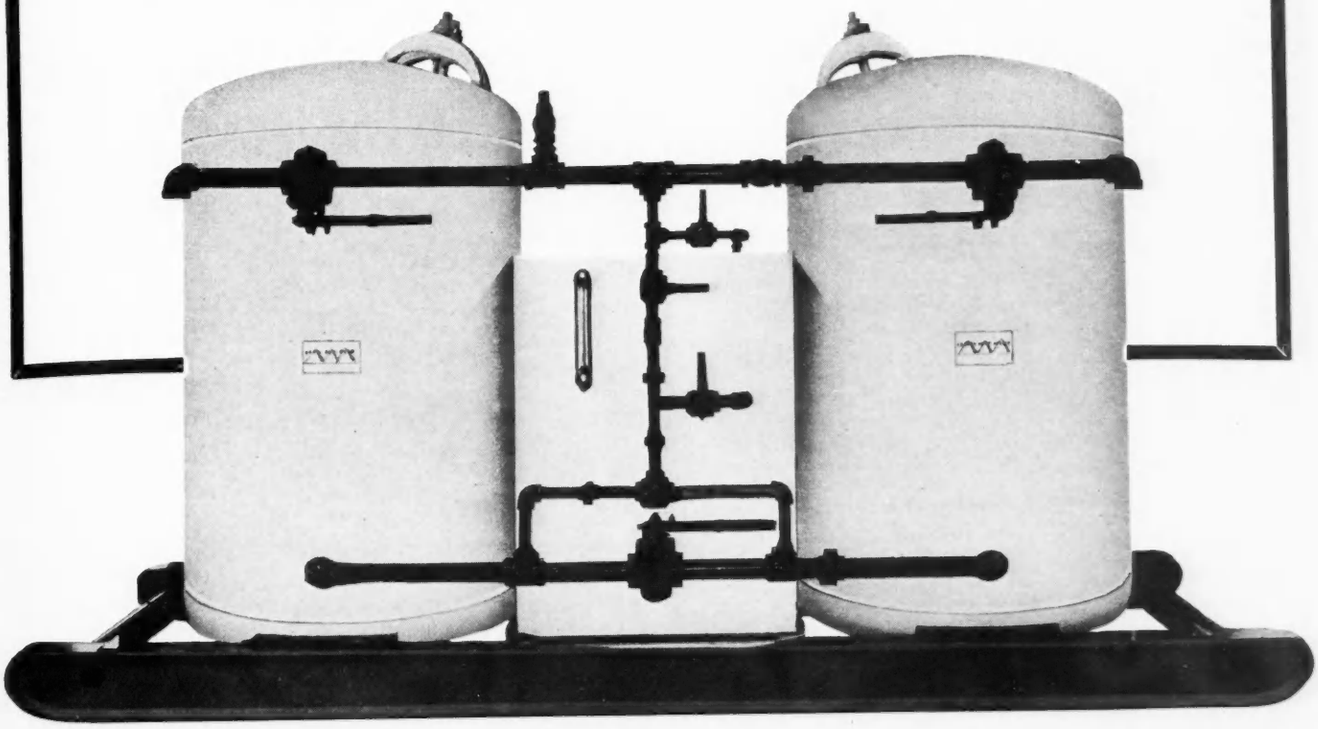

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Romana (at Berzeutz) and is now at a depth of 720 meters.

The Drilling Production and Activity

In the following figures are shown the comparative data pertaining to the drilling activity for 1936-1937 at the principal oil fields. These figures give an approximate situation for 1937 as the situation of the last two years are not known.

Taking in consideration that for the first 10 months the refineries have worked 5,600,300 tons of crude oil, we can figure that for the entire year 1937 the quantity of crude oil distilled was 6,720,000 tons, taking for November and December 1937 the corresponding average monthly quantity of the last 10 months. The above quantity is 93 percent of the crude oil production of Roumania. In 1936 the refineries distilled 8,038,000 tons of crude oil. The decrease in 1937 is 1,318,000 or approximately 17 percent. The capacity of refineries being 12,000,000 tons per year, 56 percent of this capacity was used in 1937. The products obtained from first distillation can be valued to 6,530,000 tons against 7,909,100 tons in 1936, a decrease of 18 percent.

OIL FIELD	PRODUCTION (TONS)		
	1937	1936	1937 Against 1936
Gura Onitzei	1,509,000	1,895,700	— 386,700
Boldeshti	1,360,000	1,405,200	— 45,200
Bucshani	1,056,500	2,176,500	— 1,120,000
Moreni	820,000	738,200	+ 81,800
Piscuri	557,000	510,000	+ 47,000
Ochiuri	406,000	353,000	+ 52,900
Ceptura	318,000	321,300	— 3,300
Zarvad	258,000	302,000	— 44,000
Tzintea	139,000	41,200	+ 97,800
Chiciura-Bust	130,000	120,000	+ 10,000
Runcu	110,000	137,000	— 27,000
Filipeshti	77,000	71,000	+ 6,000
Baicoi	64,000	47,500	+ 17,500
Viforata	62,000	134,000	— 72,000
Margineni	40,000	17,000	+ 23,000
Lilieshti	3,000	1,500	+ 1,500

OIL FIELD	DRILLING (METERS)			PRODUCING WELLS	
	1937	1936	1937 Against 1936	1936	1937
Gura Onitzei	47,000	23,400	+ 23,000	12	16
Boldeshti	52,100	45,900	+ 6,200	16	23
Bucshani	47,600	139,600	— 91,900	37	73
Moreni	62,400	9,300	+ 53,100	34	5
Piscuri	34,500	20,500	+ 24,000	13	20
Ochiuri	13,500	6,600	+ 6,900	15	8
Ceptura	17,600	.....	+ 17,600	10	....
Razvad	.....	2,700	— 2,700	....	4
Tzintea	42,000	4,400	+ 37,600	12	2
Chiciura Bust	1,500	700	+ 800	1	3
Runcu	2,000	3,400	— 2,200	4	2
Filipeshti	6,000	2,100	+ 4,900	5	2
Baicoi	3,800	4,400	— 600	2	1
Viforata	1,300	1,300	.....	1	1
Margineni	17,000	13,400	+ 3,600	4	5
Lilieshti	4,000	2,000	+ 2,000	1	....

The Commercializing of Petroleum Products

Internal consumption for the first 10 months of 1937 was 1,280,465 tons, or an estimated 1,536,500 tons for the entire year, against 1,545,600 tons in 1936.

The export of petroleum products for the first 10 months was 4,775,300 tons, from which it is estimated 5,635,000 tons went out during the year of 1937, against 6,884,780 tons for 1936, a decrease of 1,249,800 tons, or approximately 18 percent. The value of the exports for the first 9 months, officially established by the Financial Ministry was Lei 9,526,288,000, against 8,960,636,000 for the entire year of 1936. The value of the complete export for 1937 can be estimated to be 12,500,000,000 Lei which represents an increase of 35 percent over 1936, due to favorable prices. Although the export was decreased 18 percent, the realized value of the exports increased 34 percent.

Japan

[*Continued from page 182*]

plant has already begun operating on gas from the shallow sands of Gyuzan. The other unit and the gasoline plant are scheduled to be put in operation as early in 1938 as possible, as two pressure wells drilling in Rokujukei are nearing the high-pressure, wet gas sand in which completion is contemplated.

Editor's note: In addition to the foregoing data furnished by Mr. Uyeno, information received from other sources indicates drilling operations in Nippon are being carried on on a larger scale than ever before, with the Japan Mining Company and Asahi Oil Company, not mentioned above, participating in the struggle to make the nation less dependent on imports for domestic needs. Besides the Yabase district activity, Omonogawa, Innai and Niigata districts reported completions.

The extent to which Japan is dependent upon outsiders for her petroleum needs is reflected in some figures recently compiled by Paul P. Steintorf of Tokyo. Due to the Nippon government's war time policy with respect to release of statistics dealing with the oil industry, these figures are restricted to the first six months of 1937. They show the production of petroleum products in Japan in units of cases of 36 liters each (approximately 9.5 gallons each) from domestic crude and imported crude. They also show total imports of the various finished products in the same period. Steintorf's data follow:

Japan's Supply of Petroleum Products First Six Months of 1937

	Domestic Production				
	From Domestic Crude	From Imported Crude	Imports	Exports	Total Supply
Gasoline	1,799,000	10,182,000	9,084,000	36,000	21,029,000
Kerosene	995,000	1,400,000	1,520,000	367,000	3,548,000
Power kerosene	1,297,000	1,409,000	67,000	8,000	2,765,000
Lubricating and machine oil	1,312,000	2,806,000	1,507,000	328,000	5,297,000
Heavy oil	1,945,000	5,306,000	23,007,000	5,000	30,253,000
Totals	7,348,000	21,103,000	35,185,000	744,000	62,892,000

The figures above represent an increase of about 19 percent over the total supply of products for the first half of 1936, the domestically produced products gaining 31 percent.

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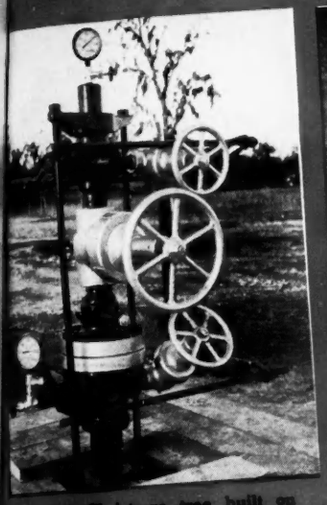
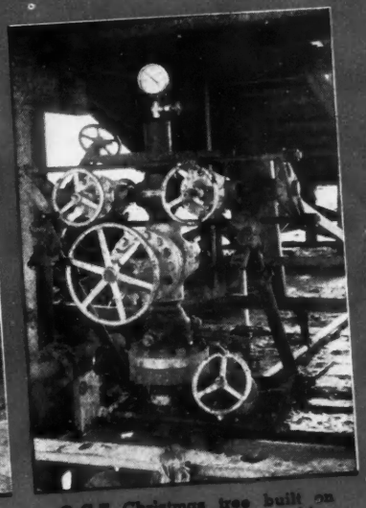
O-C-T Christmas tree built on O-C-T Type "T-16" Flanged Tubing Head. Fairbanks, Texas (discovery well).



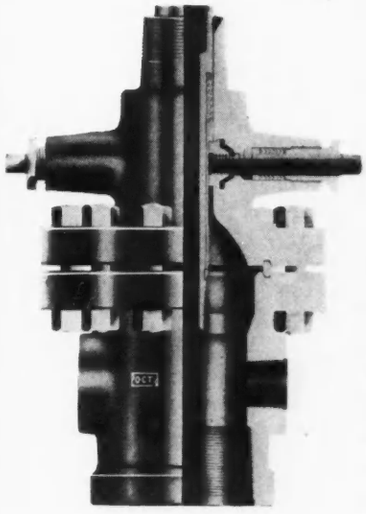
O-C-T Christmas tree built on O-C-T Type "T-19" Tubing Head. Hardin, Texas field.



O-C-T Christmas tree built on O-C-T Type "T-19" Tubing Head. Hastings, Texas field.

O-C-T Christmas tree built on O-C-T Type "C-7" Casing Head and O-C-T Type "T-19" Tubing Head flanged together. Dickinson, Texas field.

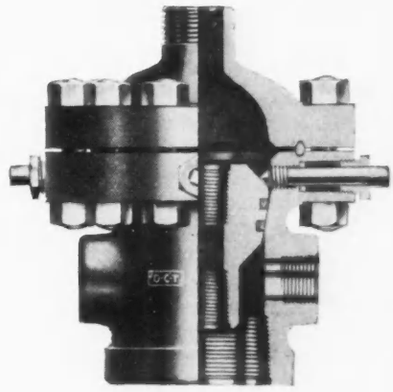
O-C-T TYPE "T-19" TUBING HEAD



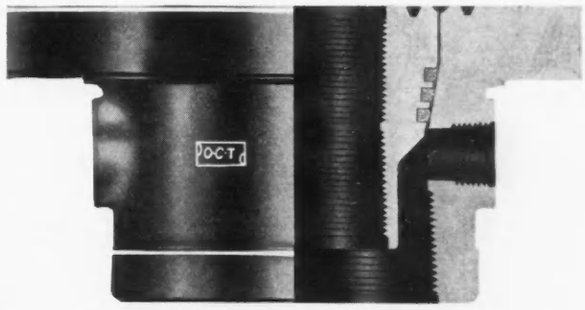
This O-C-T Tubing Head, having retractable hanger seats, permits tubing collars and tubing hanger to pass through the head to facilitate washing behind liner and setting packer. After drilling plug and running in a few joints of tubing with liner and packer, blowout preventer is replaced by Christmas tree made up on top of Tubing Head connection which is stripped over the tubing and installed on the body of the head. An O-C-T stripper rubber blowout preventer installed above the Christmas tree permits running tubing to bottom in safety, collars and hanger passing through the stripper rubber which serves as a stuffing box while washing behind liner. After washing and setting packer, tubing is raised to suspension point and retractable seats screwed in to engage hanger.

O-C-T TYPE "T-16" TUBING HEAD

The design of this O-C-T Tubing Head permits the use of flanged blowout preventer equipment for running and landing tubing under pressure, the hanger passing through master gate and blowout preventer. Tubing is suspended from a tapered hanger which seats in the bowl of the body and is forced into sealing position against pressure by means of lock-down screws provided. This head permits reworking of the well under pressure at any future time, using a tubing choke and reinstalling blowout preventer equipment.



O-C-T TYPE "C-7" CASING HEAD



The O-C-T Type "C-7" Casing Head is designed for use with flanged master valve and blowout preventer equipment. The casing hanger, available for either threaded or welded casing, passes through the master valve and blowout preventer equipment and seats in the tapered bowl of the body. Three rings of hydraulic packing in the hanger effects an efficient seal. API ring grooves provided on top flange and on top of hanger.

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New Guinea

Significance seen in fact that three strings of tools have been ordered by Dutch-American combine for large concession in one of the wildest areas under observation for oil deposits.

A ROYAL decree issued December 28, 1934, marked the official beginning of Netherlands New Guinea Petroleum Company, jointly formed by Royal Dutch Shell, Standard Vacuum Company, and Standard Oil Company of California to test out possibilities of a 10,000,000-hectare concession in New Guinea. Stock in the joint company is controlled 40 percent by the Royal Dutch, 40 percent by the Standard Vacuum Company, and 20 percent by Standard Oil Company of California. This partnership means, through corporate affiliation, that Standard Oil Company of New Jersey, Socony Vacuum Oil Corporation, and The Texas Company have chips in the pot too.

But the unofficial birth of the idea of the jointly-owned company goes back much further, for a cable from The Hague published in Batavia, Java, March 31, 1933, said in part:

"Management of De Bataafsche Petroleum Maatschappij, subsidiary of the Royal Dutch Shell, has announced to the press that since 1930 it has been negotiating with the Dutch government about 5-a contracts for oil exploitation in Netherland New Guinea. Because of the great difficulties which the Bataafsche Petroleum Maatschappij would have to face in connection with developing the New Guinea areas, it was of the opinion that competition should be barred and it is intended to start exploitation in co-operation with two large oil companies."

At that time, the companies were said to be largely interested in the Vogelkop area in northwestern Netherland New Guinea, which comprises the western half of the Island of New Guinea.

The program conceived to limit development in the Dutch part of New Guinea to the new organization had certain influence there and possibly elsewhere in the Netherlands Indies for a while.

But New Guinea today, and that includes Dutch New Guinea and Papua, too, is far from a one-company proposition. Several organizations are taking part in the drive to develop production on the British part of the island as well as the Dutch part. And exclusive of seepages observed, and on the strength of the size of the great island alone, especially in the absence of condemnatory data, chances for production should be considered good. Its total area is 326,000 square miles. Dutch New Guinea has 146,000 square miles, while the eastern part, British controlled, has 180,000 square miles.

Aerial surveying of the 10,000,000 hectares was just about completed in January, 1938, though some of this work was expected to be completed in February. George F. Barnwell, with Nederlandsche Koloniale Petroleum Maatschappij, says that when the work is finished nearly 20,000 overlapping air photographs on a scale of 1:40,000, exposed at an elevation of 12,500 feet, will have been taken. To accomplish this, four airplanes and a staff of over 30 technicians, including pilots, navigators, photographers, mechanics, and engineers, as well as a large administrative staff, have been called into play. Their task was one of the largest aerial surveys ever undertaken for petroleum exploration, if not the largest. The aviators left Holland in September, 1935. Two land and two seaplanes were shipped also, three of them being planes especially designed for using the vertical camera.

Geologists followed on the heels of the aerial mappers, and their work by surface geology and geophysics, plus core-drilling continues.

The company has made no announcement of findings, but it is significant that three strings of tools have been ordered for the 10,000,000-hectare concession. From one to three locations will be spotted for drilling in 1938, with the Shell subsidiary, De Bataafsche Petroleum Maatschappij, in charge of operations. News from the Far East is that several likely structures have been found, but official confirmation of this information is lacking. The concession of the company in New Guinea as shown on the accompanying map is purely schematic to show the relative size of it and does not indicate the position and boundaries of it.

Now the Netherlands New Guinea Petroleum Company is inter-

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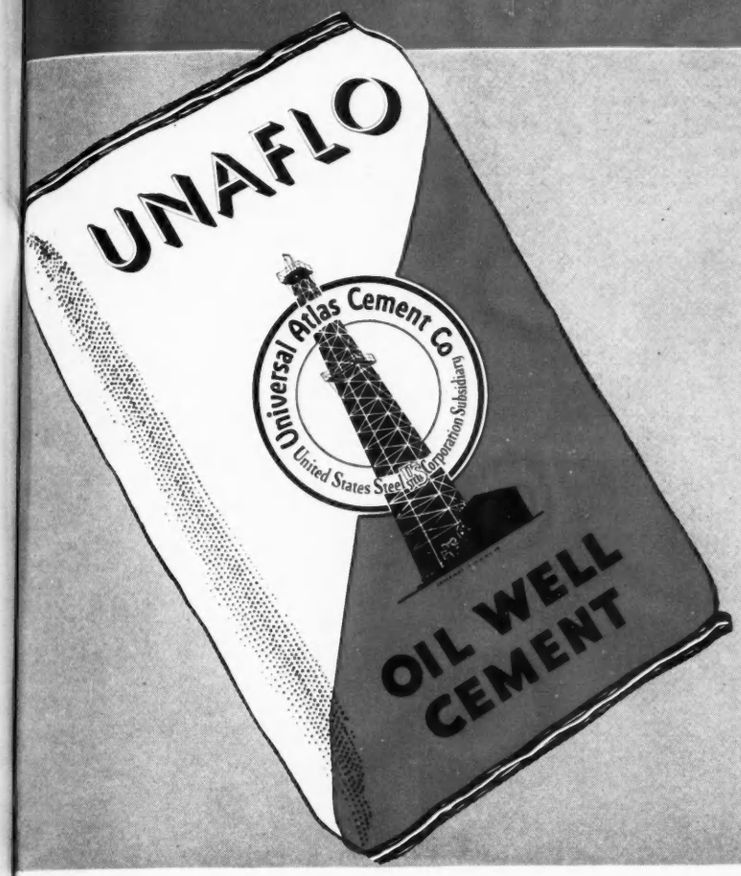

To do a good job under conditions like these

This was a barge job in southern Louisiana.

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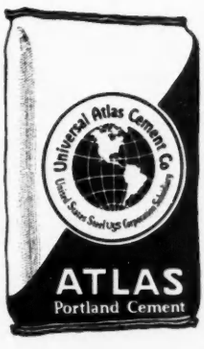

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USS

Universal Atlas

CEMENTS

ested primarily in Dutch New Guinea, and it is reported the organization does not think a great deal of oil opportunities on the British portion of the island, due partly, perhaps, to the dampening effect of existing legislation. However, Dr. W. G. Woolnough, geological advisor to the Commonwealth of Australia, infers that prospects of attempting to develop production in that part have been expedited by recent legislation. The old laws did not too greatly encourage wildcatting. He says:

"Several of the major oil companies have taken up concessions under the new legislation, involving the expenditure of large sums of money in preliminary operations of a specified nature. While it is known that in some instances promising structures are under investigation, the reports of operations are confidential."

Woolnough also stated in effect that "While unquestionably there exist ample evidences of the existence of petroleum in highly folded rocks of Tertiary age, mechanical difficulties associated with the occurrences—thick beds of bentonitic character, locally known as "running mudstones," rendered all drilling operations abortive with the technique then available." (Prior to 1930.)

An Australian company, Papuan Apinaipi Company, the doctor advises, has secured a concession over an area which includes the Popo district, where the previous unsuccessful drilling was carried out. This company will investigate possibilities of the Apinaipi dome, mapped long ago by Anglo-Persian Oil Company, now known as Anglo-Iranian Oil Company. The Apinaipi organization in February, 1938, was concerned chiefly with scout drilling and geological surveying. It is expected that this work will require some months, so that location for the first wildcat may not come from the company before late in 1938. One of the guiding spirits in the Papuan Apinaipi Company is R. S. Haynes, formerly with Anglo-Iranian Oil Company. Although his company withdrew, Haynes must have felt that the little 75-square-mile concession situated just 86 miles northwest of Port Moresby on the southern coast of Papua must have had definite possibilities.

D. Dale Condit, formerly chief geologist with Oil Search, Limited, an Australian company which has been and is interested in developing Papuan production, records among concessionaires in Papua: Oil Search, Limited, Islands Exploration Company, Limited, which is a Vacuum Oil Company interest, Papua Oil Development Company, which is a Shell interest, and Oriomo Oil, a company controlled by Oil Search, Limited. Condit, incidentally, is now in the service of Standard Vacuum Company in New York. The map, appearing herewith, was prepared by him before he left Oil Search.

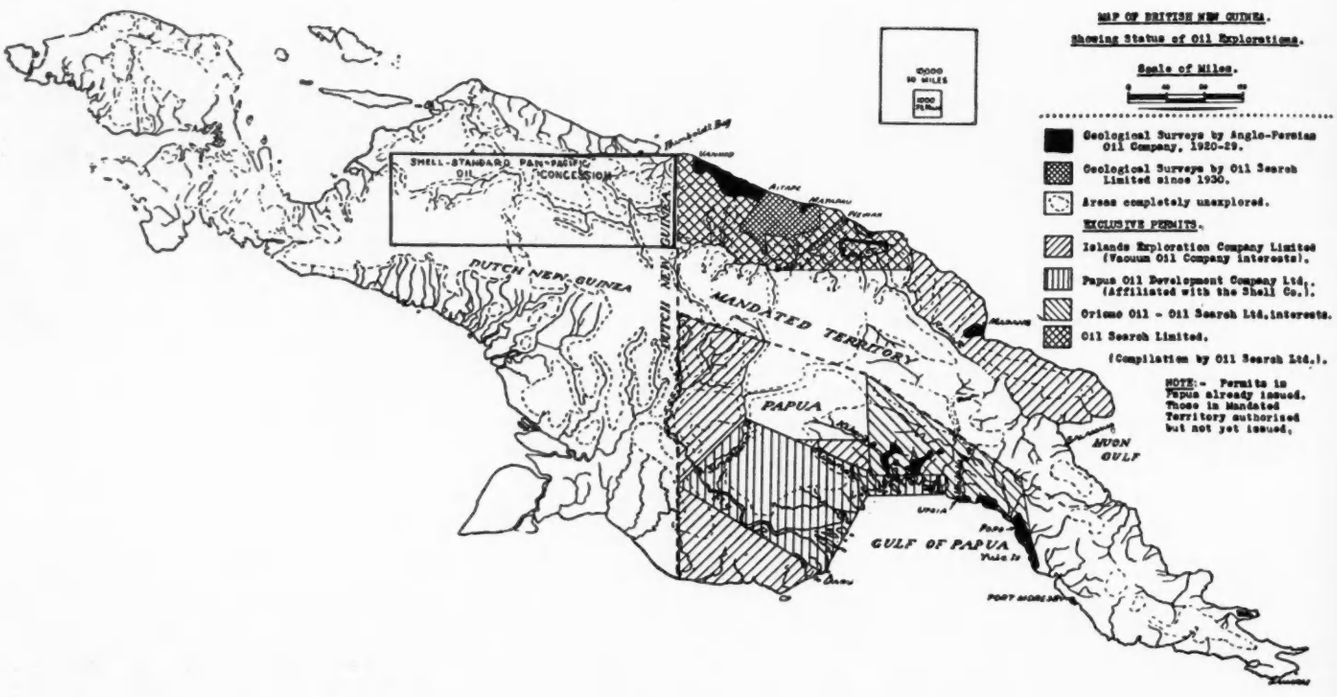
Condit has made quite a study of the history of the search for oil in Papua. In telling of this he brings out the following facts:

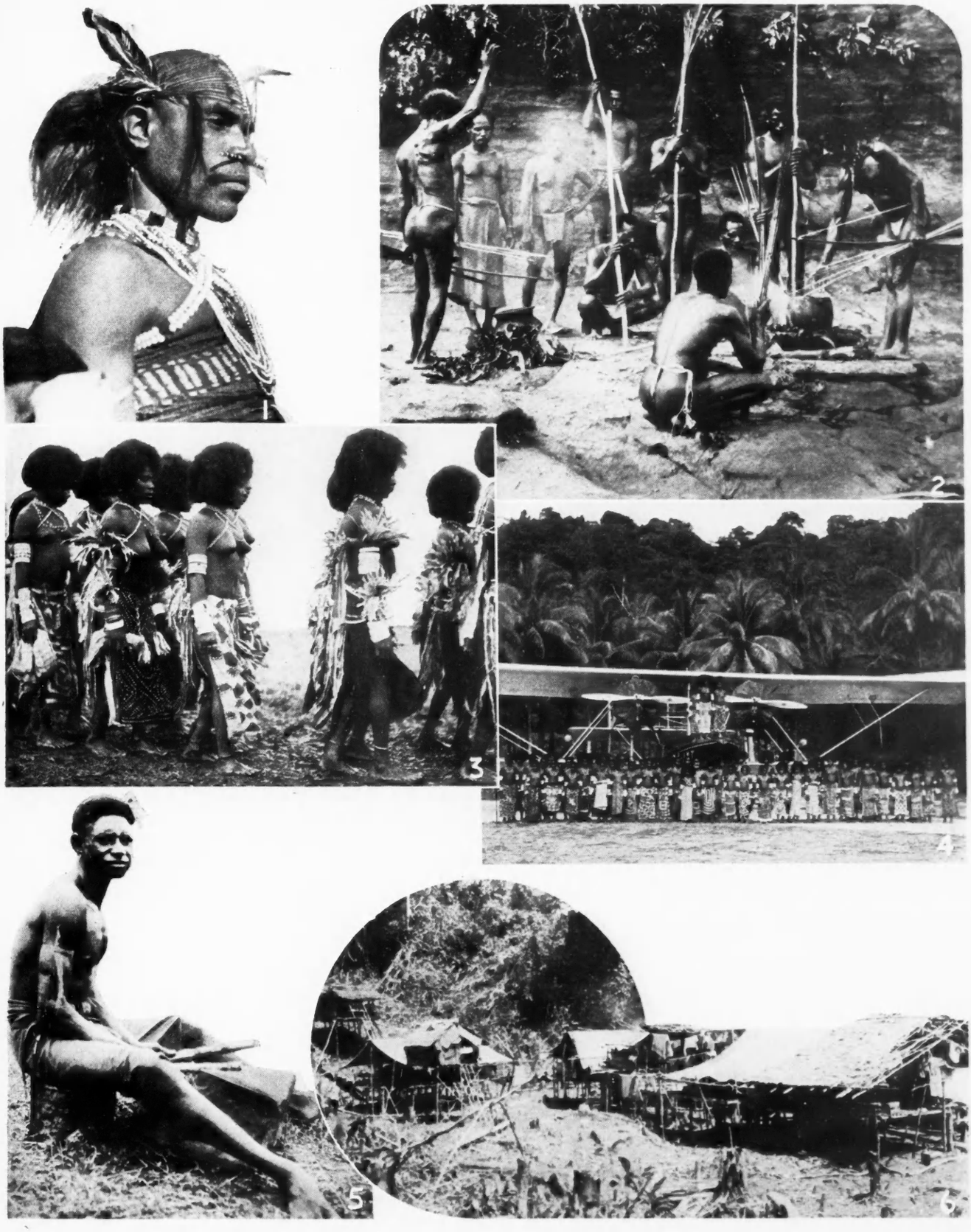
Oil seepages in Papua were first discovered in the Vailala River district in the gulf district in 1911. E. R. Stanley, government geologist, made the preliminary investigation of the seepages in 1912-1913, with Dr. Arthur Wade, now with Freeney Kimberley Oil Company of Australia, and assistants making more detailed study later. Drilling, meanwhile, had started at Upoia on the river, but failed:

"Selection of Upoia as the most favorable locality to drill depended entirely on the existence of seepages—there having been no geological recommendations."

Anglo Persian Oil Company drilled 9 wells, the deepest to 1770 feet, before withdrawing from the neighborhood in 1920.

Before the World War, Germany, which then owned the eastern half of the island, which was known as Kaiser Wilhelm's Land,


MAP OF BRITISH NEW GUINEA.
Showing Status of Oil Explorations.
Scale of Miles.
Geological Surveys by Anglo-Persian Oil Company, 1920-29.
Geological Surveys by Oil Search Limited since 1930.
Areas completely unexplored.
EXCLUSIVE PERMITS.
Islands Exploration Company Limited (Vacuum Oil Company Interests).
Papua Oil Development Company Ltd. (Affiliated with the Shell Co.).
Oriomo Oil - Oil Search Ltd. Interests.
Oil Search Limited.
(Compilation by Oil Search Ltd.).
NOTE:- Permits in Papua already issued. Those in Mandated Territory authorised but not yet issued.
SHELL-STANDARD PAN-PACIFIC OIL CONCESSION
DUTCH NEW GUINEA
MANDATED TERRITORY
PAPUA
MUON GULF
GULF OF PAPUA
UPOIA
PORT MORESBY



1. A Papuan chieftain eyes the white men in stolid silence. 2. Fire and various offerings help these New Guinea warriors propitiate their savage gods. 3. Bushy-haired Papuan women with their barbaric trappings march in a colorful ceremonial dance at Seroei. 4. Like a Ziegfeld chorus, native women pose before a company plane with the jungle as a backdrop. This festival, at Seroei, was part of the celebration of the marriage of Princess Juliana and Prince Bernhard. 5. While pounding out a dance rhythm on a gasoline tin, this native's attention was distracted by the camera. 6. A native Papuan village precariously perched on stilts to avoid snakes and heavy rains.

—Pictures Courtesy *The Lamp*.

knew of the oil indications and had appropriated money for an attempt to develop it. Drilling equipment was reported enroute to the island when the war broke out, and Germany lost out.

However, with a combination of Anglo Persian Oil Company technologists and British and Australian government money, a series of tests were drilled around Popo on the anticline. The first well had an objective of 2800 feet, but it was abandoned, as were Nos. 2 and 3. No. 4 was started, but only £2000 per month was allotted for the work, so its progress was retarded. When No. 5 at Popo was drilling, the funds were exhausted, and operations on the well suspended.

The revised objective depth for No. 1 was 3500 feet, but it never got that deep, "running mud stones" stopping it at 1725 feet. The deepest of these tests got to only 2694 feet, leaving Popo still an unknown quantity.

In summarizing Papuan development for THE OIL WEEKLY of February 22, 1937, Condit stated:

"Other localities where more or less drilling was done included the Oriomo River area opposite Daru and the Ormildah Oil Company area at Marienburg, near the mouth of the Sepik River in the Mandated Territory. The Oriomo wells encountered granitic bed rock at an unexpected shallow depth, and the surveys were, in general, such as to throw some doubt on the prospective values of the region south of the Fly River. Results of the Ormildah Oil Company also were definitely disappointing."

But, Condit says in the same paragraph, "It should be remarked that this drilling was not based on sound guidance, a fact which is plainly brought out in the report of the Anglo-Persian geologist who examined the Ormildah concession while drilling was in progress.

Oil Search, Limited, recently, has had a party continuously in the field in the Sepik River district. It has surveyed more than 2500 square miles in the Matapau region near the coast and inland in "Uncontrolled" territory toward the Sepik River.

Referring back again to current plans of Netherlands New Guinea Petroleum Company to show an inclination to concentrate on the Dutch part of the island, it is interesting to note that Condit, speaking of the western, or British half of the island, remarked in 1937: "The need of liberalized oil ordinances has long been evident, and with the recently effected revision, interest has at once been displayed by important companies seeking concessions." Pondering this, one must consider the possibility that the "recently effected revision" may still leave something to be desired in the way of petroleum law legislation in the New Guinea of British and Australian influence. Nevertheless, in the British part of the island alone 80,000 square miles are tied up in 12-month exploration concessions.

Netherlands New Guinea Petroleum Company's concession consists of five blocks covering selected tracts in the coastal belts and swamps of Dutch New Guinea which had previously been earmarked by government geologists as likely drilling prospects. Disregarding the air mapping done, the concession is largely unmapped virgin jungle.

After preliminary work is completed, the company will be allowed to retain only 10 percent of the exploration concession for exploitation. This will bring the holdings down to 1,000,000 hectares, or 2,470,000 acres. However, rights to exploit the selected acreage will hold good until January 1, 1986.

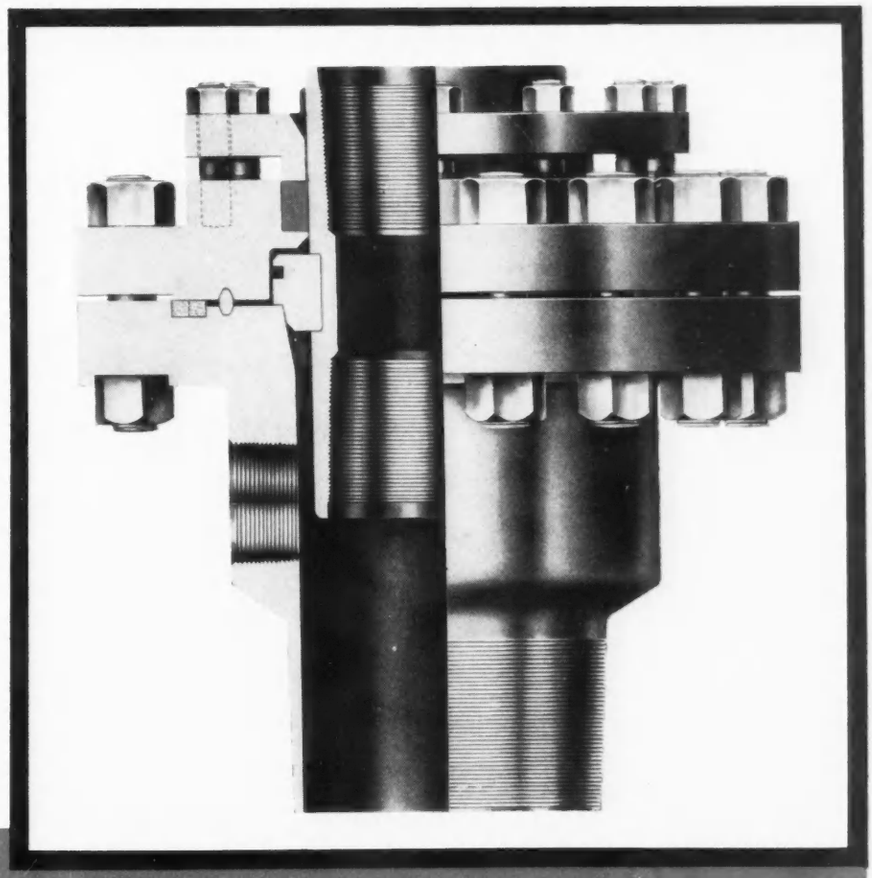
Headquarters of the company temporarily are at Bobo, where it maintains a hospital base. Bobo is on the south shore of the McClure Gulf and boasts about 70 Europeans and 500 Asiatic inhabitants to support its claim of being the largest town in the East Indies east of Makassar.

A recent issue of The Lamp, had an interesting article dealing in part with the natives of New Guinea that says in part: "Cannibalism still exists today, but is confined to the tribes living in the hinterland that as yet have not been brought under permanent control of the government. Crocodiles, malaria, and blood suckers have proved much more troublesome than the cannibals. In the coastal regions within range of the government and missionary posts, the Papuan has developed into a semi-civilized, half-clothed savage, and his transformation from a stone-age man to this happy state varies directly as the distance he dwells from these centers of incipient civilization."

Barnwell, quoted earlier in this article, stated recently: "As money has no value in Papua's primitive society, the native's poor services are paid for by pieces of white and red cotton cloth, tobacco, fish hooks, needles, mirrors, knives, axes, etc.

On excursions necessitating penetration of the interior the company uses a most unique method of disposing of the considerable nuisance, or discomfort, of consciousness of the fact that the jungle being penetrated may yield without notice a clan of head hunters. The company uses for its carriers and escorts the Dajaks of Borneo, whose reputation for being expert head hunters considerably exceeds that of the Papuan hinterlanders. And the effective part of it is that the Papuans know it and give the Dajak coolied caravan plenty of room.

An unmapped river of New Guinea looks like a huge lizard to the aerial photographer.



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Philippines

All of the natural requirements for oil accumulation are found in these islands but development to date has had no results; local laws do not encourage search

By W. J. MILLARD
Mining Engineer, Manila, P. I.

PHILIPPINE ISLANDS consist of areas of igneous and sedimentary rocks. At one time in their geological history they were entirely covered with sedimentary rocks of Tertiary age. Igneous rocks are exposed today because of uplift and erosion of the sedimentary rocks in that particular area.

Sedimentary rocks were deposited on an igneous complex basement of a Pre-Tertiary age. The bulk of the sedimentary rocks found in contact with this basement are either Oligocene or Lower Miocene in age. In this article they are termed Lower Miocene. Some writers claim to have found remnants of older sediments; but the bulk of the petroleum bearing rocks are of Miocene age. This is known by the fossil contents. Orbitoidal limestone and sub-bituminous coal beds are characteristic of the Lower Tertiary beds at the contact with Pre-Tertiary basement.

It is possible and probable that igneous intrusions have cut some, if not all of the Tertiary rocks. This is a point that could be greatly clarified by the geologists that are connected with companies mining in the igneous-sedimentary areas. Maximum thickness of the sedimentary rocks is about 7500 feet.

Structure

Intense folding has taken place in the Philippines. This probably occurred in very late Tertiary time. The usual trend of folding is northwest and southeast. In some places more than one period of folding has taken place.

Many anticlinal folds are to be found in all areas of Tertiary sedimentary rocks. In some parts of the islands many of these folds are too tightly compressed and faulted to yield petroleum. In other cases erosion has removed much of the oil bearing strata, leaving only a thin veneer of sedimentary rocks over the Pre-Tertiary basement.

Anticlinal structure exists in all parts of the Philippines. Some of the best structures are on the Island of Luzon. Some of these are to be found on lands already under lease.

It is preferable that an anticline have fairly gentle dips. The writer is familiar with producing Tertiary structure elsewhere in the world that has steeply inclined beds. None of these are over 56° from the horizontal. A great deal of structure exists in the Philippines which has almost vertically dipping strata on the crest. Unless this was due to an overturned fold or had an ample thickness of oil-bearing sediments below, one would be a bit hesitant about drilling it for oil. It is claimed that highly inclined beds are present in some of the Tertiary oil pools in California.

The best structure for testing is one of fairly gentle dips. These structures are present in the Philippines. One which the writer has had the pleasure of mapping recently is about 5 miles long and 3 miles wide. This undoubtedly has possibilities of producing oil.

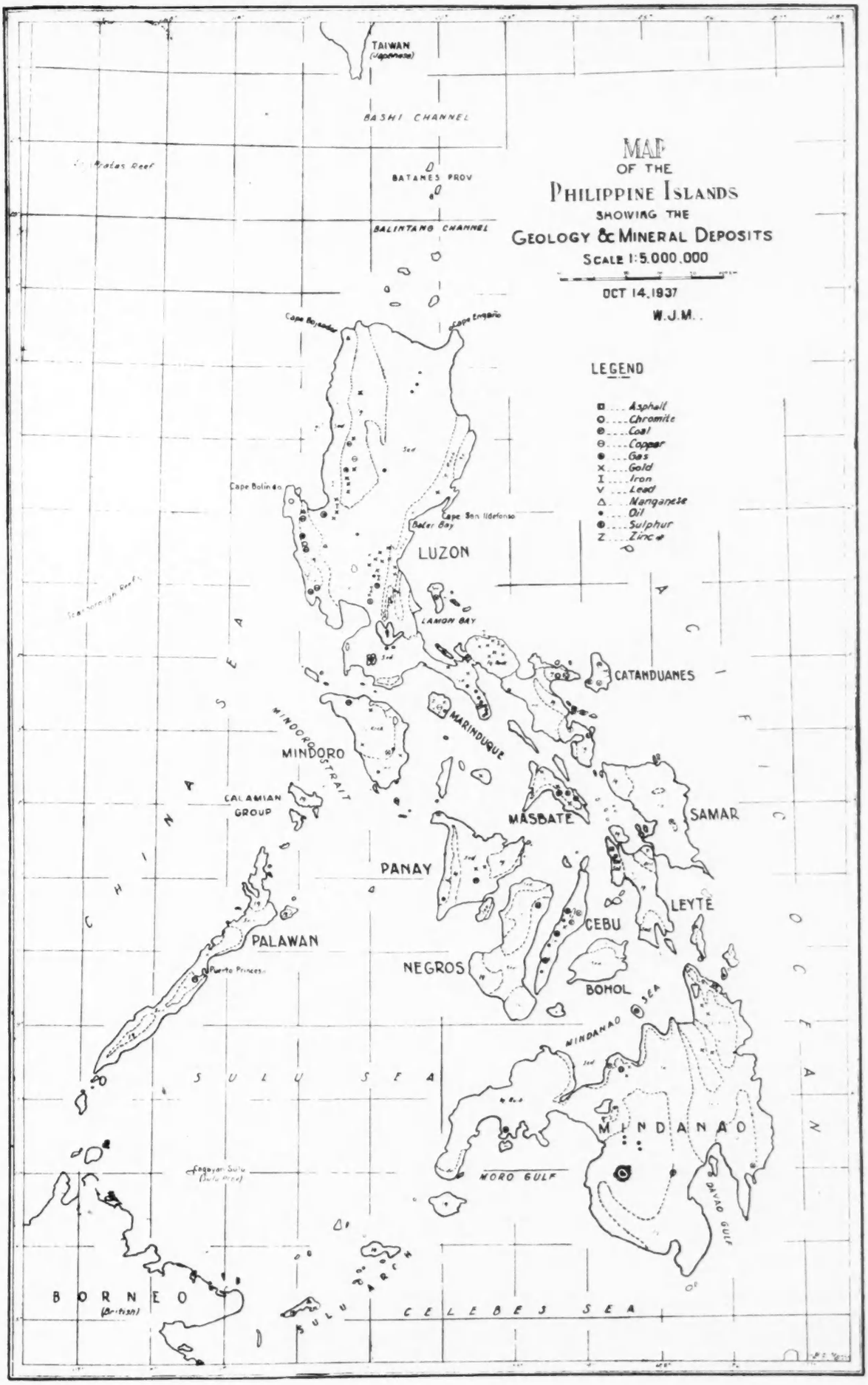
Indications of Oil

From one end of the Philippine Islands to the other end are found indications of the presence of petroleum. These consist of actual oil and gas seeps, petroliferous shale and sandstone outcrops, and shows of oil and gas discovered by drilling. There is nothing more conclusive about the existence of oil than in the actual oil seeps. In all the Tertiary oil fields of the world and in many fields of greater age than Tertiary, seeps of oil and gas are found.

On the Island of Luzon many shows of oil and gas are found in the Bondoc Peninsula. There are, however, other localities far distant from the Bondoc Peninsula where signs of oil exist. Seeps occur also on the Islands of Leyte, Cebu and Mindanao.

Oil Possibilities

Shallow wells drilled for oil in Cebu have shown that oil exists to a small extent near the surface. Deeper wells in Bondoc Peninsula, as drilled by Richmond Petroleum Company in the early twenties, found many shows of oil and gas. Failure to obtain commercial production may have been due to faulty location. That is to say, perhaps the anticlinal structure was too steeply inclined, or perhaps the structure was not closed. One deep well, Pina 1, did obtain 95,000 cubic feet of gas per day from a sand


MAP
OF THE
PHILIPPINE ISLANDS
SHOWING THE
GEOLOGY & MINERAL DEPOSITS
SCALE 1:5,000,000
OCT 14, 1937
W.J.M.
LEGEND
Asphalt
Chromite
Coal
Copper
Gas
Gold
Iron
Lead
Manganese
Oil
Sulphur
Zinc
TAIWAN
BASHI CHANNEL
BATANES PROV
BALINTANG CHANNEL
LUZON
LAMON BAY
CATANDUANES
MARINDUQUE
MINDORO
MINDORO STRAIT
CALAMIAN GROUP
MASBATE
SAMAR
PANAY
LEYTE
CEBU
PALAWAN
NEGROS
BOHOL
MINDANAO
MORO GULF
DAVAO GULF
BORNEO
(British)
SULU SEA
CELEBES SEA
CHINA SEA
PHILIPPINE SEA

at 2913 feet. It also showed the presence of numerous bodies of sand capable of storing oil down to a depth of over 5000 feet.

The Philippines have from 3300 to over 7500 feet of sedimentary strata capable of containing reservoirs of petroleum under proper conditions. On gentle, closed, anticlinal structure where the full Tertiary sedimentary column is intact, commercial production has good chances of being obtained. Many structures which do not appear ideal will perhaps also produce. While at present a great many anticlinal structures may be determined by surface geology, there are areas where the torsion balance and reflection seismograph will be found extremely useful in working out structure. Some places fairly reek with anticlines.

Oil is found in Japan, Borneo and Sumatra. Wells as high as 2000 barrels a day have been obtained on the west coast of Borneo. The Philippines lie between these oil producing countries. It is logical to expect production, since a fairly thick series of sediments of similar age exists containing oil.

It sometimes takes the drilling of several wells to find the location of an oil pool under an anticlinal structure. This is particularly true of the salt dome fields in southern Texas and Louisiana. If unusual unconformities exist under anticlinal structure, this may cause the drilling of a few dry holes before production is found. However, with the proper geological field work, the first test well on a new structure may be a producer. There is no doubt to me that oil will be found; but it remains for the drill to determine whether it will be commercial production.

Production on anticlines may be found from 800 feet to 7500 feet in depth. It all depends upon where the oil sand or sands exist.

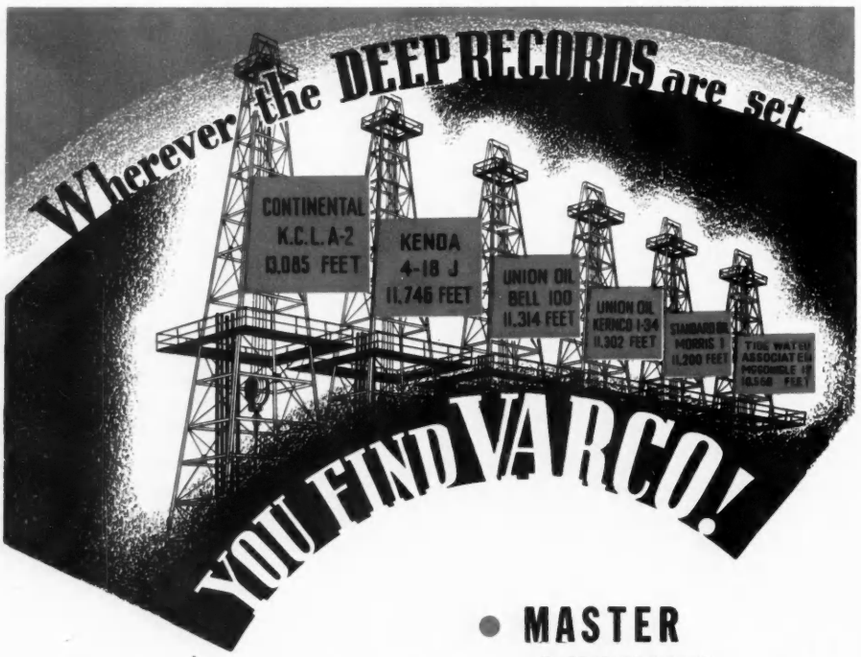
Conclusion

All of the natural requirements for the discovery of oil pools are present in the Philippines. It is believed that in some parts of the Philippines commercial production will be found. There is a large amount of territory, however, that will not produce commercially.

Editor's Note:—The Philippines comprise an archipelago of more than 3000 islands, several of which are as large as an average size state. And, as the author infers in the foregoing article, there is good reason to anticipate by analogy the production of oil in the Philippines some day. Seepages are common and conspicuous in the Philippines. In substantiation, roads in the islands are built of domestic asphaltic sandstone, evidence of the petroleum bearing ability of some of the formations of which the islands are composed. And on top of this, very little actual drilling has been done in the Philippines.

One great obstacle to development of whatever petroleum possibilities the Philippines may have has been the local laws which make it impossible for any large concessions to be available for exploratory work. The larger enterprises, those of ample financial backing to carry on a serious wildcatting campaign, have shied off due to the nature of the concessions available.

As a matter of record, Richmond Petroleum Company, beginning wildcatting there in 1921, spent $1,250,000 to prove that part of the Bondoc Peninsula on the Island of Luzon in which it was interested was dry.



NOTHING has been subject to more radical change than the mechanics of drilling oil wells. Over a period of relatively few years the record depths have changed from 3,500 ft. to 7,000 ft; then to 10,000 ft. and today the depths exceed 13,000 ft. These DEEP RECORDS have been made possible only by the use of proper tools. New tools made of alloy steels, properly designed and heat treated, to the highest physical property, are the contribution VARCO has made by supplying equipment that meets every condition with ample reserve strength to resist destruction and overcome wear. VARCO tools have always been and will continue to be of the highest standard of quality.

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New Zealand

Recent legislation vests all petroleum deposits in the Crown, but it is anticipated that should such deposits be found they will be operated by private capital.

By F. W. JOHNSTON
Christchurch, N. Z.

IN AN article on "The Petroliferous Areas of New Zealand," by P. G. Morgan, M. A., F. N. Z. Institute, Director of Geological Survey, New Zealand, and published in the N. Z. Journal of Science and Technology, Volume 7 (1925) Morgan sets out a table showing that the areas in New Zealand occupied by "post tertiary" strata comprise 18,632 square miles, "tertiary" strata 19,535 square miles and "cretaceous" strata 5674 square miles, making a total of 43,841 square miles. Morgan then goes on to say that the table shows that probably two-fifths of New Zealand contains strata that may possibly yield mineral oil and a thorough prospecting of those portions which afford indications of petroleum appears to be justifiable.

A brochure issued by the Mines Department, New Zealand, in 1925 says that indications of the presence of petroleum are found on the surface at Moturoa near New Plymouth, and elsewhere in Taranaki; over wide areas on the eastern coast of the North Island; in the South Island at Kotuku, near Murchison and in the Cheviot District. Up to the time of the publication of the brochure in 1925, two million gallons of oil had been obtained from the wells at Moturoa.

According to recent information practically the whole of the petroleum produced in New Zealand has been obtained at New Plymouth and the adjoining areas, and the total of the oil produced to December 31, 1936 is estimated at 2,631,337 gallons. At the present time three wells situated at Moturoa are producing small quantities of oil; the production from these for 1936 was 1591 gallons, and during the same year a total of 1188 gallons was collected from 5 shallow bores put down at Kotuku.

Future

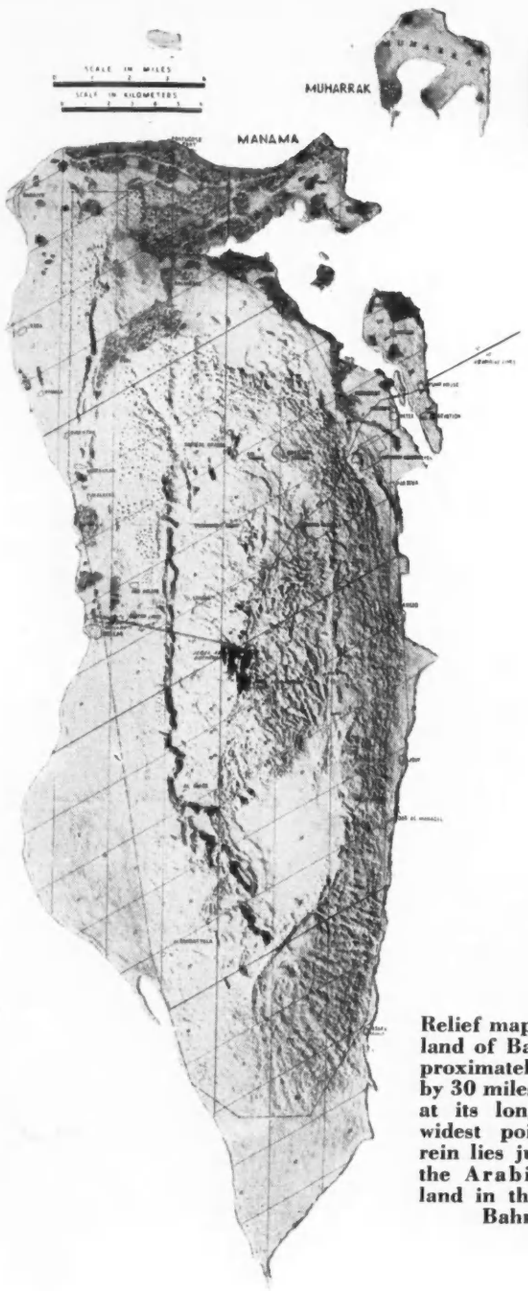
Now as to the future, in the present session of the New Zealand Parliament which is now adjourning for the holiday recess until February an Act has been passed vesting the whole of the petroleum rights in New Zealand in the Crown, the idea evidently being that the government of New Zealand shall be entitled either to prospect and, if found in payable quantities, to work the petroleum deposits of New Zealand, or to grant licenses on royalty in connection therewith. While many of our more conservative citizens consider our present government "State Socialistic" rather than "Labor" the general concensus of opinion is that if the prospecting indicates that New Zealand deposits can produce oil in payable quantities the government, rather than embark on such a highly technical industry on its own account, would grant licenses on royalties to corporations or companies employing the world's greatest experts. It is my opinion that the members of the government are far too astute to embark on such a difficult and highly technical undertaking as a state enterprise.

During the second reading of the debate on the bill the Minister for Mines, the Hon. P. C. Webb, said: "I have an assurance that when this bill becomes law a really worth while effort will be made to find out whether we have flow oil in New Zealand in payable quantities." Mr. Webb made a strong appeal to the House to consider the bill in a non-parochial spirit, claiming that in view of the importance of any "find" of oil in quantities in the Dominion the legislation was among the most important that had been dealt with by the present Parliament.

He said: "The discovery of commercial flow oil would provide one of the greatest stimulants to industrial development in New Zealand. It suffices for me to say that under the present laws an adequate search for oil is not being made—the position is being merely tinkered with, and it is quite impossible for a small enterprise with antiquated plant to find out definitely whether we have oil in any quantities." Then again: "It is incumbent on New Zealand to make the most systematic efforts possible in the search for oil. This search is one of the major national problems facing the Dominion at the moment. The entire transport system is based largely on oil and its by-products, and in the event of hostilities abroad New Zealand's fuel supplies would be cut off."

It is difficult for anyone not "in the know" to state definitely what is being done or intended to be done in connection with the further prospecting and exploitation of the possible oil resources of New Zealand, but it is said that some of the larger oil concerns in America are interested, and that the British Admiralty is also interested, and that we are on the eve of major explorative work being conducted on a large scale with the most modern equipment.

Bahrein Island



Relief map of the Island of Bahrein, approximately 10 miles by 30 miles in extent at its longest and widest points. Bahrein lies just east of the Arabian mainland in the Gulf of Bahrein.

By R. L. DUDLEY

DISCOVERY of a new producing horizon, and beginning of plans for repressuring the prolific "second pay," were highlights of operations on Bahrein Island, where The Bahrein Petroleum Company, Ltd., sole operators, completed 8 wells during 1937, bringing the total number of proven wells on the island up to 46. Production of the island during 1937 was 7,762,264 barrels. Production from discovery to January 1, 1938, was 13,989,057 barrels.

Approximately 11,000 acres have been proven on Bahrein by wells drilled to the second pay, the limits of which have been pretty well defined. During the year the island's largest well (No. 55) was completed to the second pay with an estimated open flow potential of 50,000 barrels of 33 gravity oil per day. Four wells are either drilling or rigging up on the structure. The rotary method of drilling is used.

Well No. 52, the "deep" test, encountered the regular formations (the first, second and third pays—the second

Air-conditioned camp of Bahrein Petroleum Company on Bahrein Island. Day temperatures frequently are as high as 115 degrees. Night temperatures run about 30 degrees lower. Air-conditioning reduces these temperatures 15 degrees.

Finds Deeper Oil Pay

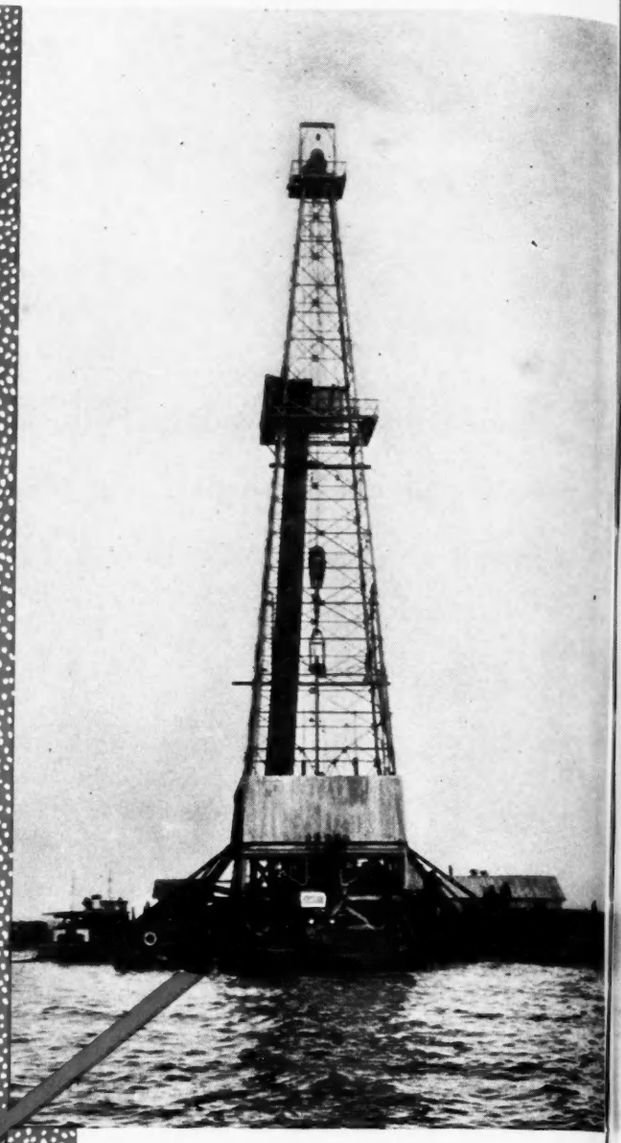
Fourth lime zone produces both gas and oil; repressuring experiment planned. New refinery now in operation.

being the most important) and at 4100 feet entered limestone carrying heavy gas pressure. Approximately 550 feet of this lime, broken occasionally, was encountered. This new gas sand has never been tested in its entirety but the operators say that it looks to be good for 100,000,000 feet of wet gas. The gas condenses out about 250 barrels of 60 degree gravity distillate per 10,000,000 cubic feet of gas, which in itself makes this gas pay well worth while. However, at 4638 feet a lime pay, carrying 38 gravity oil was encountered. A drill stem test between 4638 and 4680 feet showed 7,000,000 feet of gas, 840 barrels of 38 gravity oil with 650 pounds back pressure. The next drill stem test was made at 4681 to 4741 feet and showed 1395 barrels of fluid of which 60 percent was oil and 40 percent water, through small drill stem, against 225 pounds back pressure with about a quarter of a million feet of gas. Drilling ahead, quite a bit more water was encountered and then a dry zone, then water bearing formation. This well is temporarily shut down at 5225 feet.

A rig has been moved to Well No. 51 to deepen to the heavy gas sand encountered in No. 52 with the idea

His Excellency, Shaikh Hamad bin Issa Alkalifah, ruler of Bahrein.

A MILE OUT and a MILE DOWN WITH T·I·W·SLIPS..



Picture at the right shows

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a mile off shore of Chambers County

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Drilled below 6,000 feet, this hole has opened up the first oil field in the bay.

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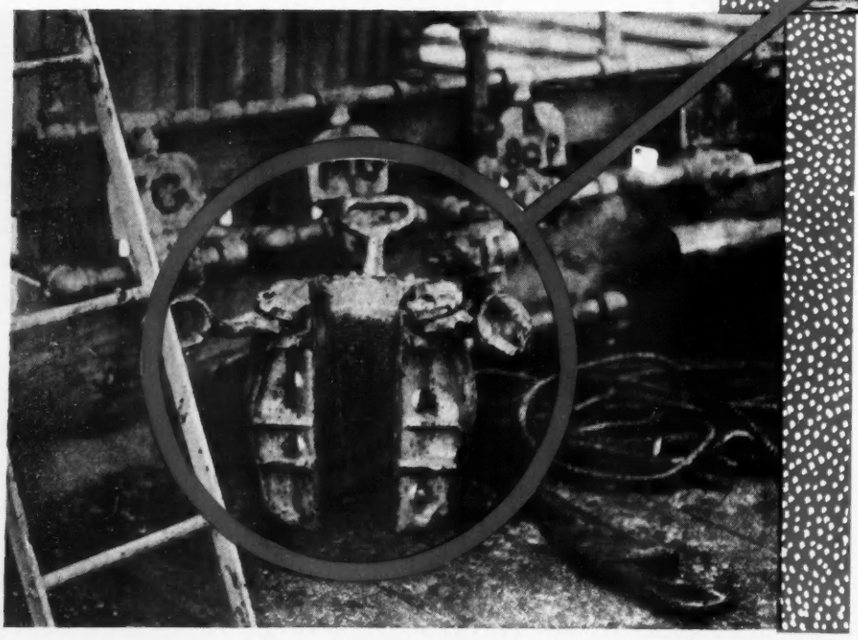
Picture below shows

T-I-W THREE-PIECE SLIPS

on the derrick floor of this well that is being followed with so much interest by the oil fraternity.



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Bahrein Company's hospital, showing the landscaping that has been done on it.

of using the gas under its natural pressure to re-pressure the second pay. Surface pressure in the upper part of this gas sand is 1950 pounds with bottom hole pressure approximately 2200 pounds. Well No. 51 is located 1000 feet from 52.

This repressuring effort is the first attempt to re-pressure a large limestone reservoir by gas injection. It is felt that the regular formation pressure of this deeper gas sand will suffice to conduct the experiment.

Another deep test has been started with the idea of exploring still further the deeper formations which carry gas and oil in No. 52. This is Well No. 58, located about 3500 feet east of No. 52. Latest reports from the island indicate that 16-inch casing has been set at 1542 feet.

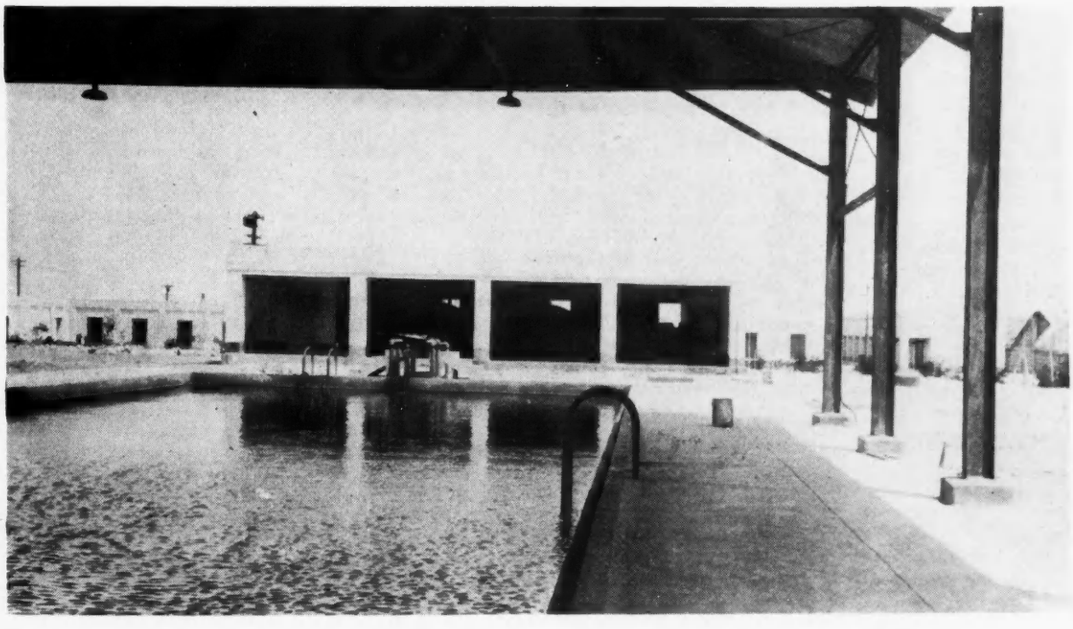
During the year two additional sea lines were laid, bringing the total up to three 12-inch lines, one 10-inch line and one 8-inch line.

On December 11 official opening of the new refinery owned by the company on the island was held, Shaikh Sir Hamad bin Issa Al Khalifah, ruler of Bahrein, officiating. The refinery is a 25,000-barrel plant, modern in every respect.

During the year the company continued air-conditioning its employes' quarters. Temperatures on Bahrein during the day run frequently as high as 115 degrees. The atmosphere is humid. The air-conditioning efforts are designed to reduce the temperature about 15 to 20 degrees, thereby giving the employes comfortable sleeping. All future housing structures will be air-conditioned.

Storage facilities already installed on the island had a capacity of 2,407,150 barrels at the close of 1937, of which 541,200 barrels is crude storage.

As to the potential of the wells already completed, no estimate is made but certainly the field could produce for a considerable time at a rate substantiallly higher than its present production without the drilling of additional wells. The wells, instead, are being produced in accordance with good engineering principles. No. 55, the biggest well drilled to date, with a rated open flow production of 50,000 barrels per day, is being allowed to produce only 2500 barrels per day.



The employes' swimming pool includes water-clarifying apparatus.

[*Continued from page* 54]

wells have been sunk since near Lakes Entrance, all encountering oil of similar quality in glauconite sands of Oligocene age, resting unconformably on bed rock consisting of granite or metamorphosed sediments. But the production is obtained along with artesian water and it is very difficult to bleed off. Practically all of the wells are noncommercial.

One well, however, Austral Drilling Syndicate's Foster Bore, yielded 30 imperial gallons of oil per day along with considerable water for 11 months. Midwest 2, located 700 yards north of Foster Bore, averaged 15 gallons per day for 12 weeks. The government will help finance drilling three or four wells in 1938 near these two. All wells in Lakes Entrance vicinity are bottomed on bedrock at depths ranging from 660 to 1472 feet, the paper stated.

Though eight deep tests have been drilled to the deeper Tertiary west of Lakes Entrance, nothing of importance has been found.

Still further west of Lakes Entrance, the governments of Victoria and of the Commonwealth are scout drilling a plunging anticlinal structure in the neighborhood of Sale and Longford. An effort is being made to determine whether oil forming conditions may have been developed in the marginal facies between the freshwater and marine phases of the Oligocene.

Operations are at abeyance in the states of South Australia and Western Australia. Dr. Woolnough feels that most of the money spent in South Australia wildcatting has been wasted, 9923 feet of plutonic igneous rocks or Pre-Cambrian crystalline schists having been penetrated out of a total of 41,666 feet drilled.

In the northern part of Western Australia state the basin of the Fitzroy river, a previously condemned area, has taken on a new aspect due to the fact that Dr. Arthur Wade has satisfactorily established that not one of the eight wildcats drilled in the area was located suitably as to its structure, although some of them had evidences of oil in rocks of Permo-Carboniferous or Permian age. Another development in this area of importance to future wildcatters was the wiping out of the incorrect belief that there was an absence of cover rocks suitable for the preservation and retention of oil supplies. Existence of great thicknesses of dense shale has been established. Several delineated closed domal structures of major dimensions have been found. It is the desire of Freney Kimberley Oil Company to start drilling on some of these as soon as possible.

Roma, 320 miles west of Brisbane, is the focal point of oil activity in the state of Queensland. North of Roma several structures have been mapped out by Oil Search, Limited; at Hutton Creek, 60 miles north of Roma, a well drilled by the company to 3715 feet with showings of gas, and the well is being deepened after installation of a heavier rig made available by the government. At Arcadia dome, a well drilled to 4110 feet had gas showings at 3055 and 3170 feet. It will be deepened when the percussion rig is replaced by a modern rotary with government help.

In the Hunter River Basin north of Sydney, New South Wales, Oil Search, Limited, has been drilling on two domes. One test has been drilled on Kulnura dome to 5450 feet, the bottom 2560 feet being fresh water coal measures with marine intercalations. But the coal measures have been passed through and drilling continues in underlying marine beds of Permo-Carboniferous age. Large gas showings were encountered on another dome, Mulgoa, 30 miles west of Sydney in a test drilled to 3125 feet, capacity of the rig.

Cuba

Speaker reports no developments of importance during year

ROY E. DICKERSON of Philadelphia, who last year at the annual gathering for the foreign production symposium presented a remarkably thorough discussion on the Vinales limestone of Cuba, again covered that country for the institute Wednesday afternoon with a brief statement that no important new developments took place there in 1937. Bacuranao field is producing 100 barrels of oil per day, while the total yield from the Motembo Basin and Vesubio areas is 120 barrels daily of *natural gasoline*.

Canada

"Canada's leading field will be extended," Hume

G. S. HUME Geological Survey, Department of Mines, Ottawa, presented a paper on "Petroleum and Natural Gas Developments in Canada During 1937", in which he stated that the production figures, showing an increase from 1,498,006 barrels in 1936 to 2,995,025 barrels in 1937 for all of Canada, give a very incomplete history of developments.

"The oil supply in Turner Valley increased so rapidly in the late summer of 1937 that pipe lines and market facilities could not be adjusted to the new conditions with sufficient rapidity to take care of the whole production."

The result was proration, 65 percent at first, 35 percent at the end of the year, when it was boosted to 42 percent.

Turner Valley, Hume's paper brought out, produced 2,767,908 barrels of the Dominion's total in 1937. Its production in 1936 was 1,278,000 barrels. Production from other parts of Canada is relatively small and shows slight variations only from year to year.

"In December, 1937, and January, 1938, tests made by the Alberta Department of Lands and Mines showed a potential crude oil production in Turner Valley of 26,803 barrels, an amount sufficient to take care of the needs of the whole of the Prairie Provinces of Canada," Hume stated. This production is coming from 35 wells, 25 of which were 1937 completions. Seven of them originally were naphtha-gas wells, but production in them has gradually become heavier, until they are now producing crude.

"Production has been greatly augmented in Turner Valley by the use of acid. The productive reservoir rock is Paleozoic limestone and dolomite, and in the wells 5000 to 10,000 gallons of 15 percent hydrochloric acid have been used."

Proven crude oil areas on the western flank of southern Turner Valley is three miles long and three quarter miles wide. "There is no doubt that drilling will greatly extend this area, as the production limits are so far not defined to the south, north, or west," Hume stated.

Amount of closure within Turner

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Valley's proven crude area is 3718 feet on the top of the Paleozoic limestone, with no edge water having been encountered and a probability that oil occurs at a considerably greater depth down the west flank, the paper brought out. The deepest well in the crude area is 7475 feet; the shallowest, 6060 feet.

East of Turner Valley and west of High River, Alberta, as well drilled to 8988 feet, hit water and was abandoned. Offsetting this, the year's accomplishments in wildcatting included discovery of production on the Taber structure in southern Alberta by Plains Petroleum Company. The oil is 27.5 A.P.I. gravity. On Battleview structure, west of Ribstone and east of Wainwright, a wildcat showed a saturated core and a large flow from Lower Cretaceous at 1893 feet. It is shut in.

Bow Island gas field is still being repressured with gas from Turner Valley, almost 10 billion cubic feet of gas having been forced back into the reservoir. These operations, which began in 1930, have gradually built the pressure up from 248 pounds to 542 pounds.

In the old Petrolea field, discovered in 1865, a well encountered Pre-Cambrian granite at 4120 feet. No production was found below the regular horizon from which this old Ontario field continues to yield a small amount of crude after 72 years of continuous operation, Hume's paper declared.

Mexico

Prolific wells at Poza Rica cause production gain . . . future up to government

V. R. GARFIAS and A. C. Fernandez of Cities Service Company, New York, stated that, due to Poza Rica field mainly, production in Mexico registered an increase of 5,571,000 barrels in 1937 to bring the total recovery for that year up to 46,738,000 barrels.

Poza Rica, although completing only two wells during the year, produced 18,634,000 barrels in 1937 as against 14,162,000 barrels in 1936. An increase of 1,930,000 barrels was recorded by the heavy-oil district of northern Mexico, fields of the Golden Lane remaining unchanged, and those of the Isthmus of Tehuantepec chalking up a loss of 596,000 barrels because of labor difficulties.

Mexico completed 60 wells in 1937 as against 70 in 1936, Garfias and Fernandez stated. Of these, 52 were in proven areas and resulted in 25 producers and 27 failures. Close to the Texas border in northeastern Mexico 5 gas wells were brought in. A dry hole was drilled in Las Uvas, Coahuila, and three completions in Quebrache, southeast of the heavy-oil district, resulted in two small producers and a failure. Two wildcats in San Sebastian, east of the Golden Lane, were failures.

Northern fields accounted for 11 producers and 22 failures. Golden Lane proper accounted for 1 failure only, but just north of the area 3 small producers and 2 failures were finished in Rancho Abajo and San Miguel Tres Aguas.

One of the Poza Rica completions was in proven territory, but the other extended the field 1¼ miles southeast, giving it an area of 8¼ square miles.

"It is expected that drilling activity and production will decline in the Northern and South fields of Mexico during 1938," Garfias and Fernandez stated. Their conclusions also remarked:

"Production in Poza Rica will largely depend on the attitude of the Mexican government regarding the issuing of drilling permits and on the result of the drilling campaign of Petronac, the government-owned company. The total output of the Mexican fields in 1938 may well reach over 50,000,000 barrels, the increase largely coming from Poza Rica."

India

Latest official production data is 1936 which was record year

INDIA'S fall from eleventh place among oil producing nations of the world in 1929 to thirteenth place was described in the paper on that country submitted by the Geological Survey of India.

For some reason, as has been true of India in the past, the figures presented in the paper were old, the latest being for the year 1936. But they are the only official ones coming out of India, and for that reason were presented for the records.

The gist of the paper was that production in India, including Burma, increased from 322,662,336 gallons in 1935 to 334,811,624 gallons in 1936, the highest figure in the history of the industry there. Singu contributed 16,500,000 gallons of the increase; Yenangyaung, 1,500,000 gallons, and Attock, 1,000,000 gallons. Digboi and Yenangyat each dropped 3,000,000 gallons.

Yenangyaung maintained its reputation of being one of the most "wonderful fields of the world," production in 1936 showing a slight increase and the resources of the field as a whole "are sufficient to assure an adequate supply of oil for many years." Yenangyaung had 3029 wells on production at the end of 1936, including 193 whose completion dates back to the days of hand digging. Search for deeper sands in the southern part of the field were disappointing during the year, but that search continues.

"Satisfactory results continue to be obtained from gas drives in the leased blocks; gas is also injected with the object of repressuring and storage." Majors apply backpressure to young wells.

Singu's production increase was was caused by rapid development of the southern part of the field. "At the end of 1936 wells on production numbered 480, compared with 465 in December, 1935." A number of reserve wells are cemented above the productive sands, to be completed as needed. Wells with high gas/oil ratios in Singu are shut in, and the balance of casinghead gas remaining after satisfying field requirements is returned to dry gas sands for storage, the paper said. Repressuring operations of British Burmah Petroleum Company gave satisfactory results, and a gasoline extraction plant was installed in Singu during the year by this company. Burmah Oil Company, Limited, also active in Singu, is still building a training wall in the Irrawaddy River to reclaim a potentially productive area. One well drilled behind a completed portion of this wall confirmed the presence of productive sands.

While gas lift and gas displacement pumping is used on some wells in Singu, most of them continue to be pumped by ordinary pumping methods.

In the paragraph dealing with Thayetmo district, the Indian paper said, "At the end of the year, Burmah Oil Company's deep test at Monatkon had been drilled to 8065 feet without encountering any productive sand."

Prospecting operations in the Surma Valley were concentrated on the new wildcat at Masimpur. Drilling difficulties brought about by the nature of the formations and extremely high pressures resulted in a fishing job, blocking progress. At the end of the year tests of formations drilled through were being made. Also, a start had been made on an extensive program of core holes for additional information on the alluvium covered flanks of the anticline.

On Dhulian dome a deep test commenced in 1934 was taken to 7863 feet, but was shut down when the Indian paper was prepared. A second deep test there was drilling at 6923 feet as the year closed.

Roumania

Production declines despite more and deeper drilling in 1937

ROUMANIA'S production for 1937 amounted to 54,142,600 barrels, a decrease of 10,319,636 barrels from the amount produced in 1936, according to figures presented before the symposium by Dr. W. P. Haynes of New York, Standard Oil Company of New Jersey. These figures are significant in view of the fact that footage drilled in Roumania totaled 1,300,000, an increase of 220,000 feet over the amount drilled in 1936.

Boldesti, Moreni, and West Gura Ocnetei remained the most important fields of Roumania as there was only one discovery during the year, that of Manesti, where only three gas wells were completed.

Deep drilling occupied the limelight, Haynes said, opening production in the Meotic at Tintea and along the south of the fault between Tintea and Baicoi. Completions to date indicate high rates of production and competitive drilling which may boost Roumania production this year. Boldesti field was extended north and west, and Ceptura renewed activities on the north flank. In Piscuri the Meotic has proven productive over a wider area than anticipated.

Roumania's petroleum laws, though improved lately, are still largely inoperative in those respects calculated to encourage private enterprise. After permission for 80,000-acre concessions for exploratory purposes, with a clause allowing the operator to retain 6000 for exploitation, was indicated as a possibility by the revised laws, numerous concerns made application for such grants. But so far the Roumanian government has not awarded any of them.

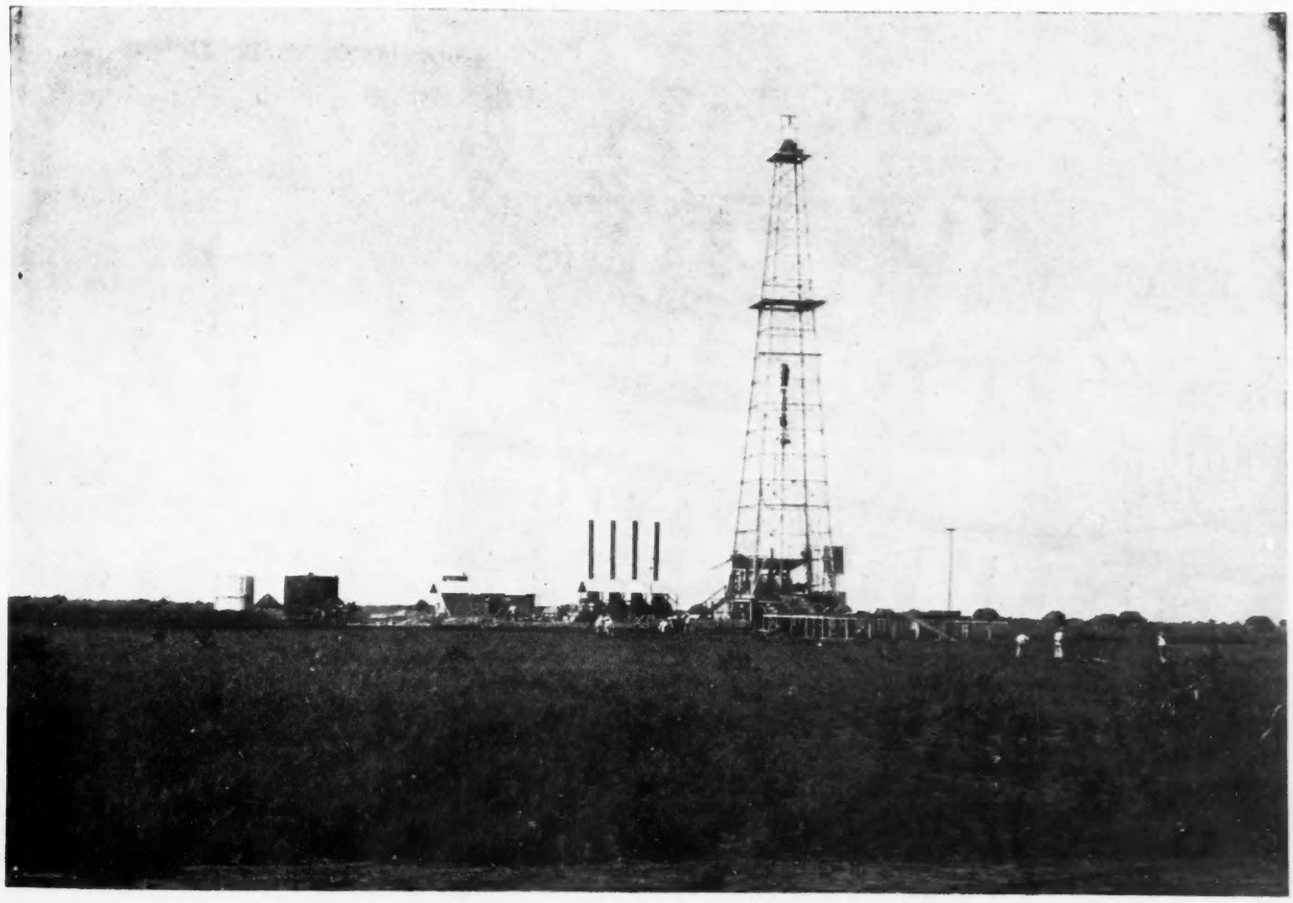
When Benjamin Craft, professor of Petroleum Engineering at Louisiana State University, Baton Rouge, took over the chair, it was brought out that financially the companies in Roumania continue to work under great difficulties, due to the delays experienced as a result of the exchange system. Difficulties continue in obtaining import permits, especially on oil well equipment from America.

Dr. Haynes also abstracted orally the paper presented in briefed forms in these columns on Austria, Hungary, and Czechoslovakia, the author of which was not present. And the paper on Iraq was presented by title only as official sanction of its presentation was not received from abroad.

Egypt

Production in 1937 was below the previous year; more intensive development in prospect

A PAPER on Egypt, sent in by the department of survey and mines, Cairo, dealt only with Hurghada, the sole producer of commercial oil in Egypt. It gave the field a total production of 4,325,000 English tons to the end of 1937, with the 1937 production of 163,500 tons representing a decrease of



An operation of Venezuela Gulf Oil Company in District of Freites, State of Anzoategui, Venezuela.

—Photo by Philip Andres.

11,200 tons from the 1936 output. However, the average oil production per acre to the end of 1937 was estimated at 4119 tons. At the end of 1937 there were 78 wells on production, all pumping. Gravity of Hurghada oil at 60°F. is 0.90 and the base is mixed.

There was no discussion following presentation of the short Egyptian paper although that nation promises to be one of the hot spots of that part of the world during 1938, with highly competitive major companies holding exploratory concessions which will be drilled on this year.

O. B. Hopkins, whose paper on Peru is abstracted elsewhere in this article on the Institute's foreign production symposium, had some interesting comments to make on that country which were not included in his paper. He said that as much as 40,000 to 50,000 barrels per acre had been recovered from some of the fields located inland in Peru. These are producing from Conglomerate. He said that in looking for new areas or better pictures of old areas the seismograph did not function so effectively. "The best pictures we have gotten, generalized pictures, you understand, have been with the gravimeter."

Papers scheduled for presentation on Argentina, Dutch East Indies, Bahrein Island, France, Germany, Burma and England did not arrive in America in time for the meeting.

Central Europe

Austria's field extended; Hungary gets oil production; Czechoslovakia is quiet

Brandon H. Grove, Socony-Vacuum Oil Company, Incorporated, Hamburg, Germany, presented a paper on Austria, Hungary, and Czechoslovakia, highlights of which follow:

Zistersdorf field, Austria's only producing area, was slightly extended by completion of a 120-ton Sarmat sand well at 1447 meters. After several months water appeared and gradually increased to 50 percent of the yield. Step-outs from this extension found the sand wet. An attempt to extend the field five kilometers northeast found all sands water bearing also and was stopped at 1383 meters.

Hungary entered the ranks of oil producing nations during 1937. Eurogasco completed a gas well at Budafa-Puszta early in the year, using the fuel to drill a second well three-fourths of a kilometer east. Budafa-Puszta 2 was then completed for 70 tons daily of high grade oil, production coming from lower Pannonian at 1168-79 meters. Pipe line to take the oil to Csomodar-Paka was completed in December. No. 3 has started drilling.

Hungary got a second field in April, 1937, when a government wildcat at Bukkszek, 125 kilometers northeast of Budapest, was completed for a small yield from spotty middle Oligocene sands. The field had 14 completions in 1937, eight of which produced about one ton per day each from depths roughly averaging 100 meters.

Czechoslovakia was quiet. Hodonin, with theoretical deep possibilities as yet untested, showed a production decline despite drilling efforts. Production in Gbely field, recently extended, rose sharply, due to success in the extension. The old field has been drilled up since 1928. Its occasionally bailed production is negligible.

Production from Apollo Company's wildcat at Ratiskovice, Czechoslovakia, proved short lived, ceasing within a month. A second well in the area also produced about 5 tons daily for a few days, then died. It is being deepened to about 1000 meters.

Government wildcatting in eastern Ruthenia continues without important developments, but the Rutgers Company has been a little more fortunate at Mikova and is preparing for extensive test drilling there.

Incidentally, the papers on Cuba, Austria, Hungary, and Czechoslovakia were not on the published program as the authors' agreement to furnish them arrived too late for their inclusion.

Peru

Production from three fields declines slightly from the peak reached in 1936

Oliver B. Hopkins, chief geologist of Imperial Oil, Limited, and director of the geological department of International Petroleum Company, Toronto, brought out that Peru suffered a slight decline in production in 1937, producing 17,466,620 barrels as against the country's peak production of 17,593,700 barrels in 1936. All Peruvian production comes from three northwestern areas: La Brea-Parinas, Lobitos-Restin, and Zorritos fields.

Two of the government's projects in Tumbes province were abandoned during the year, but in southern Peru the government plans to start drilling soon near Pirin, Hopkins said.

Drilling equipment is on the ground for commencement of Compania Petrolero El Ganso Azul's wildcat on the 90,000-acre Selden Breck concession in the Pachitea region.

Cumulative total production from La Brea-Parinas estate to Dec. 31, 1937, was 178,390,767 barrels, 14,722,754 of which were produced in 1937, Hopkins said. This field completed 47 oil wells, 2 gas wells and 8 dry holes during the year. Average completion depth was 2367 feet, compared with 1984 feet for the 1936 completions. Use of rotary in the field is growing, 31 of the completions going to its credit. Water-

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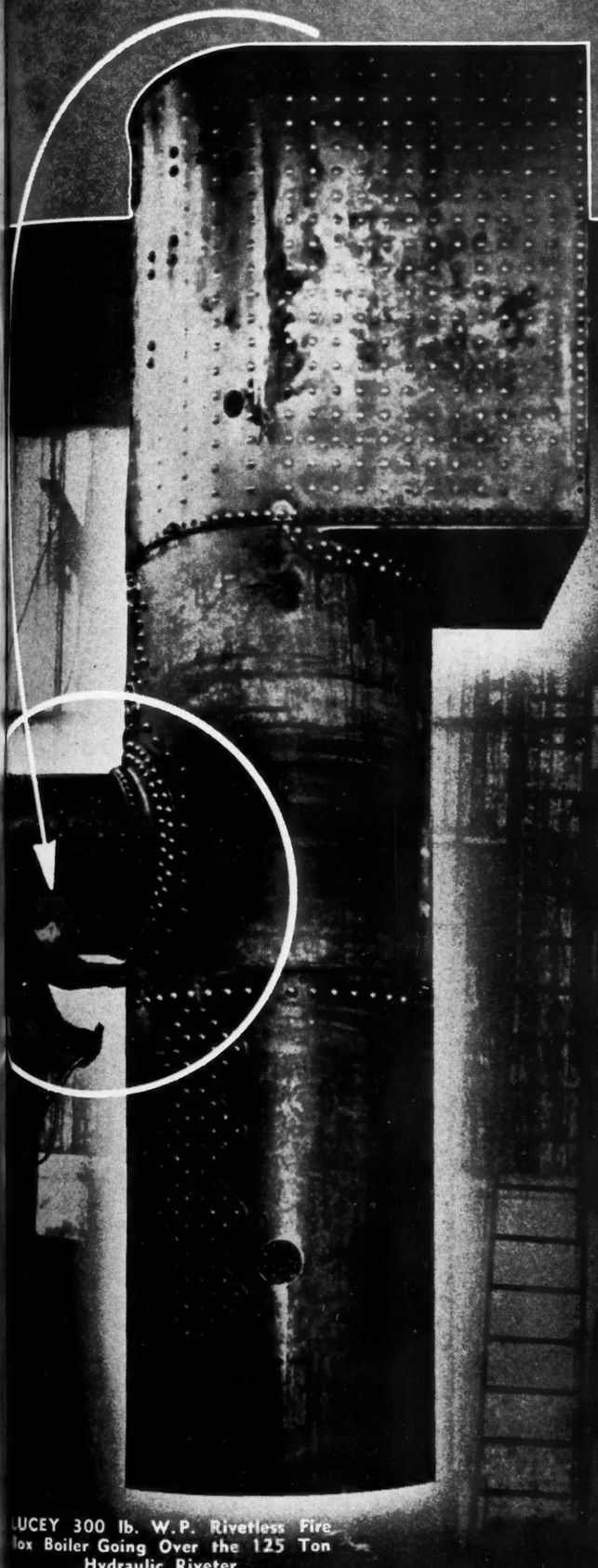

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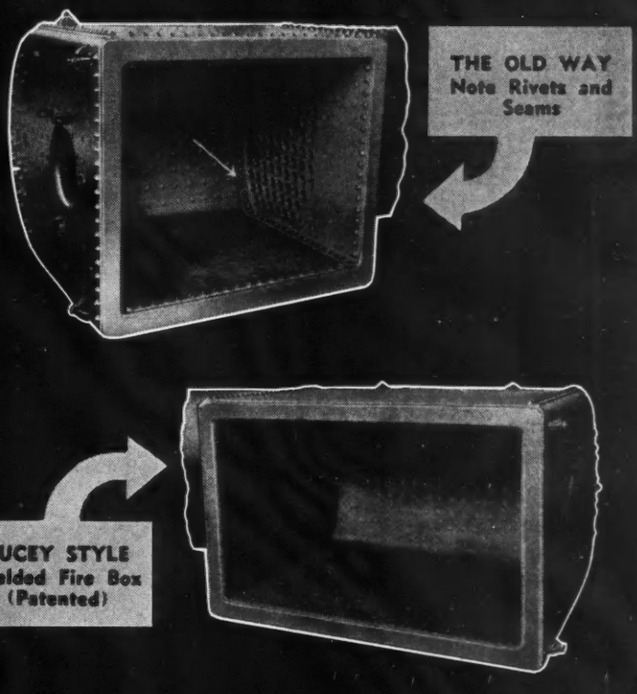

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flooding older parts of the field is being considered.

Total production of Lobitos field to the end of 1937 was 41,316,242 barrels, 2,693,866 barrels of which were recovered in 1937.

Zorritos field, operated by Piaggio and Company, produced about 50,000 barrels during 1937.

Trinidad

Production in 1937 was increased over previous years

DATA on Trinidad, not in the form of a paper, presented at the foreign production symposium, indicated a production of 15,498,350 barrels in 1937 as against 13,237,030 barrels the year before, and 251 completions during 1937. At the end of the year Trinidad had 1235 wells producing oil and gas and 2 wells producing gas only, and 13,275 acres proven for oil and gas. Average recovery per acre to the end of 1937 was 10,928 barrels. Production methods are indicated by the following division of wells: flowing, 395; pumping, 491; air and gas lift, 97; miscellaneous, 252. Trinidad's production comes from Miocene and Eocene sands.

Colombia

Intensive activity in exploration and acquisition of prospective oil lands

"THE activity in exploration and in the acquisition of prospective oil lands that reached such a high level in Colombia during 1936 gained momentum and reached unprecedented proportions during 1937. Both national and private lands were taken up," said O. C. Wheeler, chief geologist, International Petroleum Company, Limited, in his paper, "Petroleum Developments in Colombia During 1937."

Present concession holders include Richmond Petroleum Company, Shell Petroleum Company, The Texas Company, Tropical Oil Company and Socony Vacuum Oil Company.

Wheeler touched briefly on work done on the Barco Concession during the year. That particular spot is covered in a separate article elsewhere in this issue.

Socony Vacuum Oil Company holds concessions on the Rivers Sogamoso and Lebrija, work during the year being largely geological and geophysical, but including completion of a well for fuel and starting another. This organization will drill a deep test on the Restrepo concession in 1938.

Tropical Oil Company completed 70 wells (65 of them productive) on the De-Mares concession. Average initial production was 508 barrels. Production from Infantas and LaCira fields on the concession amounted to 20,297,846 barrels in 1937.

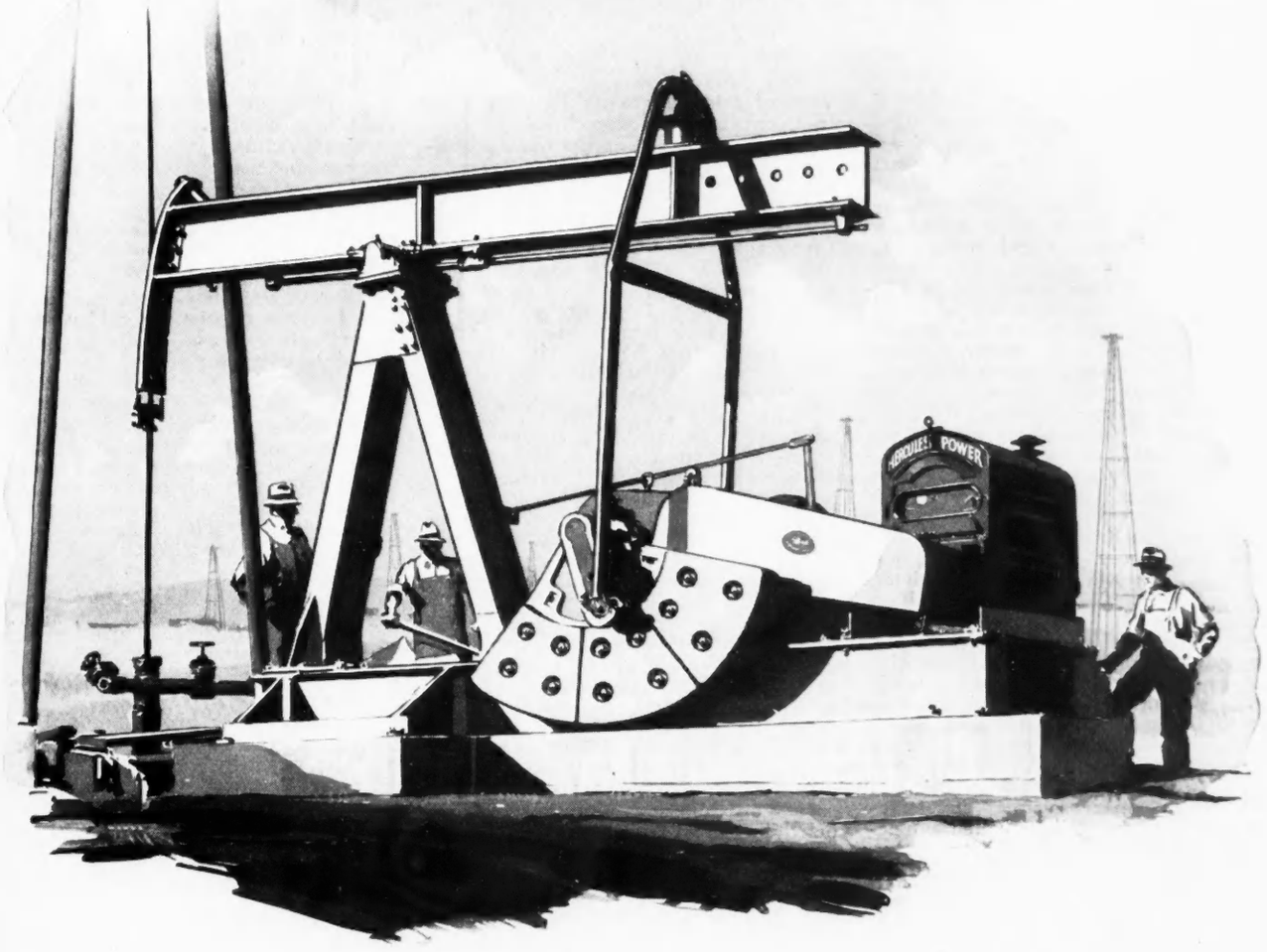
England

ALTHOUGH not on the official program, Mr. May gave a summary of exploratory efforts in England during the last few years in which he summarized the present situation as follows:

"Twenty-six percent of England is held under prospecting licenses; six wells are drilling, one is deepening, and an eighth well soon will be started."

Present leaseholders in England, May brought out, include D'Arcy Exploration Company, 8893 square miles in England and Scotland, drilling on five sites—Eskdale, Cousland, Hardstoft, Pevensy and Gun Hill; Anglo-American Oil Company, original licenses granted totaled 490 miles in South England, but requests were made for 2266 miles in central England later, drilling on wildcat below 2200 feet in Scotland; Steel Brothers & Company, Limited, 350 square miles in the Midlands, drilling at Edale, 35 miles northwest of Hardstoft; Gulf Exploration Company of Great Britain, Limited, 1946 square miles, location for test has been made.

PROVED IN THE OIL FIELDS OF THE WORLD



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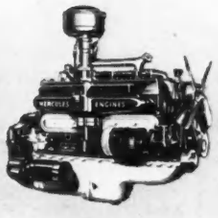

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AMERICA'S FOREMOST ENGINE MANUFACTURER
Power Plants from 4 to 200 Horsepower

Petroleum Economics

[*Continued from page 48*]

"Analysis of the prices of shares making up the index reveals important differential movements. These seem to be related to developments within the companies and to the effects of changing internal conditions of the oil industry upon the particular enterprises as reflected in their earnings and dividends."

Geophysics

THE paper presented by Rudolf K. Bernhard, consulting engineer, on "Geophysical Study of Soil Dynamics" was well received. The fundamental principle of dynamic soil tests consists in the application of artificial vibration. The technique employed is essentially geophysical in nature and in some respects is akin to seismic studies. Artificial vibration may be excited by centrifugal forces resulting from eccentrically supported rotating masses. The reactions of soil and structures caused by these vibrations may be measured. Their dynamic constants, such as amplitudes, phase speeds, damping, reflection, and interference effects, can be investigated. This geophysical method has been used for several years with increasing success, the author stated.

The two methods employed are the static and dynamic methods. The first and oldest tests to investigate the bearing capacity of the soil have been carried out by static weights. The penetration of these weights, however, depends not only on the soil but also on the size and form of their lower surface. The dynamic considers that actual loads are seldom static. Street and railroad traffic cause dynamic loads. This new method takes into account the geophysical experiences of well-known macroseismic investigations, and might well be called a macroseismic method.

The methods have a wide application of use. In several practical cases the dynamic investigation resulted in saving a considerable amount of expense, the author stated. A heavily loaded machine shop had to be built on piling. Densifying the soil by artificial vibration for about 10 inches at an expense of two to four cents per square foot improved the soil so much that the pile foundation was avoided.

Dr. Donald Barton's paper on "Trends in Gravitational Prospecting During the Past Few Years" was presented before the Thursday afternoon session of geophysics. His paper stated that while the theory of interpretation has remained practically stable for a number of years, considerable change in the observational technique has taken place during the past five years, partly for better and partly for worse.

"Gravimeters of several designs have come rapidly to the front in the past three years and have demonstrated high superiority in accuracy, speed, and inexpensiveness in mapping variation of gravity between stations which can be occupied within a few hours of each other." In speaking of the spring gravimeters, he said they are "well adapted to making of detailed surveys and the detailed reconnaissance surveys of relative gravity that are used in gravitational prospecting."

Dr. Barton listed as the main advantages of the gravimeter: great speed, low cost, insensitivity to small irregularities of mass around the instrument —whether arising from irregularities of topography or of the soil and subsoil, and the ability to hastily rough in large gravity anomalies. He listed as the disadvantages: a poor picture of the variation of relative gravity in areas favorable for torsion balance, inability to map differential curvature, inability to give any indication in regard to the variation of gravity except in the line of profile (the inability to see—as it were—away from the line of profile is particularly serious in reconnaissance), a tendency to seduce unwary geophysicists into using too skimpy a net of stations for good interpretations, and the necessity of accurate knowledge of the relative elevations of all stations, whereas in torsion balance surveys the elevations are needed only immediately around the station site.

"Gravimeter surveys at best can give only 80 percent as much information as a torsion balance survey if the results of the latter are good, and the average gravimeter survey will probably give 50 to 60 percent as much information as a good torsion balance survey in regard to the anomalies of petroliferous structures. Although I am a firm believer in the gravimeter, I believe that the practical effect of the replacement of the torsion balance by the gravimeter will be a slight deterioration of the quality of the interpretation of subsurface structure from gravity surveys.

"Gravimeters have come rapidly into use in many parts of the world in the past three years. Four years ago there were only three gravimeters in the area of the Humble Oil & Refining Company. On January 1, 1938, there are 27. A general tendency in the use of gravity prospecting is to use it as a reconnaissance method in order to find possible prospects on which to use the reflection seismic method."

Electrical Prospecting Summary

A summary of electrical prospecting for oil structures was given Thursday afternoon before the geophysics section in a paper prepared by J. J. Jakosky, director of research, International Geophysics, Incorporated, Los Angeles.

In speaking of the method in general terms, Jakosky's paper said that development of this method unintentionally has been contemporaneous with its commercial application. Largely because of the many interesting problems encountered during the development stage, it has been necessary to carry on extensive research work to develop new equipment and to assist in the interpretation of the field data.

"Due to the simple relationship existing between resistivity and near-surface structure, it was originally thought that interpretation of the data would not present any undue complications. As the depth of penetration was increased, however, and the deeper lying structures began to have a less, and in fact a minor effect on the measured 'resistivity' values, it was necessary to take into account, and to properly evaluate, the near surface effects. The effective depth at which interpretable results could be obtained has been steadily increased, until today considerable exploration is being conducted at depths of 6000 feet. This increased depth has widened the use of the method and greatly increased its commercial importance."

Jakosky's paper brought out that at the close of 1937 there has been covered an area in excess of 10,000,000 acres by electrical prospecting. In addition, he said over 1,500,000 feet of traverse lines had been run, chiefly in the San Joaquin Valley and in the coastal areas of the Los Angeles Basin in California.

The author's conclusion was: "In view of this past work and the many check results which have been obtained on the work, it is clearly established that this method is of economic importance in deep structural mapping for oil exploration."

Geophysical Education

TUESDAY afternoon the petroleum section went into joint session with the Mineral Industry Education and the Mining Geology divisions for a round table discussion on geophysical education. Such men as Sherwin F. Kelly, chairman of the A.I.M.E. committee on geophysical methods of exploration; M. King Hubbert, instructor in geophysics, Columbia University; C. A. Heiland, professor of geophysics, Colorado School of Mines; David A. Keys, professor of physics, McGill University, and Donald C. Barton, consulting and research geologist and geophysicist, Humble Oil & Refining Company, Houston, contributed papers.

Hubbert's paper, titled "The Status of Geophysics in a Department of Geology," said that students now studying geology according to the curricula of the departments of geology of our universities emerge as professionals with only the vaguest comprehension of the enormous body of knowledge now in existence dealing with the earth and its physical phenomena.

"Furthermore," Hubbert stated, "since students with just such training are

still being appointed to the chairs of the departments of geology, provision is being made for the perpetuation and aggravation of an already anomalous condition."

Hubbert made the point that more attention should be paid to physics, chemistry and astronomy in the education of a geologist.

"Geophysics, far from the trivial subject it is commonly erroneously assumed to be, is the study of all earth phenomena, with the explicit recognition that they are also physical phenomena. Moreover, the physical study of a number of major subjects that once were regarded as being parts of geology has progressed so far as to constitute virtual capture, in that these have come to be discussed in such physical language as to be no longer comprehensible to the majority of the members of the geological profession."

Hubbert's paper, 29 pages long exclusive of bibliography, brought out that this evolutionary progression cannot be stopped and probably not even retarded. Departments of geology as now constituted are in the position of being left farther and farther behind. He suggested departments of geology install divisions of geophysics in the true sense of the word, allowing the geophysicist the scope and freedom that his subject requires and such physical equipment and research funds as are necessary for his purpose.

Introduction of such a program would require major adjustments of the geology curriculum, most important of which would be elementary courses of geophysics, preceded by an elementary knowledge of college physics and mathematics, as a prerequisite to the higher degrees. This adjustment would serve to repel the inferior type of student who at present takes geology when he would not dare to attempt to meet the requirements of a more rigorously exacting science, and it would attract the superior type of student.

"There seems little reason to doubt ultimately that all students of earth phenomena will come to speak a common, basic language, which will be a composite of the present languages of the physicist, chemist, astronomer, biologist and the geologist," Hubbert said. Speaking of the evolutionary paths to this goal, the author continued: "One possibility is that the geological profession come to a recognition of the problems and accordingly adjust its educational procedure to embrace the more fundamental sciences. Or it is possible that students of physics and chemistry may proceed to investigate the remaining terrestrial phenomena that have never satisfactorily yielded to the conventional geological approach."

Hubbert's concluding paragraph heralded a warning to geologists. It said:

"If, on the other hand, members of the geological profession do not see fit to make these necessary adjustments, there can be no doubt that the invasions into the territories that have been traditionally regarded as belonging to the geologist will continue to be made by workers who have been trained in the fundamental sciences until little of what once was geology will remain."

Hubbert's paper before the Petroleum Division's joint session with the roundtable on geophysical education Tuesday afternoon was followed by that of C. A. Heiland, professor of geophysics, and Dart Wantland, assistant professor of geophysics, both of Colorado School of Mines. Title was "The Organization of a Department of Geophysics."

In personalizing the inception or beginning, of geophysics, particularly as applied to oil, the authors stated:

"There was once a little kid, and his way was a very tough lot until he grew up. His parents did not have much in common. From all indications it is probable that the child was not wanted. His father, geology, and his mother, physics, separated shortly after his birth, which occurred during the World War amid a smoke screen of mathematics. His parents could not agree on a name and they finally christened him 'geophysics,' for short. His relatives insisted the name should be 'geophysical prospecting,' or 'exploratory geophysics.' Though the youngster has grown up by now, this fight is still going on. His father did not think the kid would amount to much until he began to show some unexpected talents which were acquired, no doubt, from his mother, physics. The kid's progress caused the father no little worry; he began to wonder whether his offspring would help him in his business when he grew up, or whether he would set up shop in competition with the old man. His aunt petroleum watched his growth with benevolent interest; his uncle mining remained rather skeptical and cousin civil engineering not only assumed the attitude of the man from Missouri, but was not much convinced even after he had been shown. The kid decided that he had to stand on his own feet—follow his father's and mother's footsteps as much as possible, and develop the good qualities of both. As a result, the youngster did fairly well for himself, and his relatives decided that it might be to their advantage to be on better terms with him."

The two professors then told a sad tale of how both parents fought for custody of the child, but the boy decided not to take sides. He had learned that both of them had their good points, although they couldn't get along.

"It is highly probable," Heiland and Wantland opined, "that a study of the recent geophysical literature prompted our old friend Aesop to tell us this fable. It seems that the geologists and physicists have decided to move into opposite camps and that neither is willing to give much ground. There have been strong expressions by the physicist that he is quite capable of giving an interpretation to his findings without the help of the geologist. The geologist has countered with the statement that geophysics was nothing but a tool of geology."

The authors inferred both are wrong; both need each other. "The intricate nature of geophysics require the closest co-operation between the physicist and geologist. The field is large enough to give both of them ample diversion, and occasional headaches, and there is every opportunity for either geologist or physicist to specialize in the phases of the work for which he has been trained."

Training men for the above indicated functions in the oil business (and mining) forms the backbone of the curriculum for geophysical engineering established at the Colorado School of Mines after 11 years thought on and readjustment of the courses, Heiland and Wantland explained.

"The industry employing geophysical engineers has a right to expect them to be trained in geophysics, not merely in geology, physics and mathematics. An oil company hiring a petroleum engineer today expects him to be familiar with the methods of petroleum production and refining and does not hire a man for such a job if his education has been confined to chemistry or basic engineering only." The authors presented a table showing the more important courses required of geophysical engineers at their school. The table included courses in geophysics, geology, physics, mathematics, civil and mechanical engineering, chemistry, languages and economics. Students looking for a degree in geophysics take ordinary and partial differential equations in their junior year as required subjects and potential functions and vector analysis in their senior year as electives. In physics they take general physics and electrical measurements in their junior year and thermodynamics and radio in their senior year. In languages, German has been required of geophysicists during the past years." Two general courses in geophysics are given in the junior year, one dealing with the principles and methods, and the second with applications to type geologic problems. Two of four graduate geophysics courses are open to seniors. In the first semester magnetic and electrical prospecting are offered; in the second, gravity methods and seismic prospecting.

The paper was brought to a close with expression of opinion that it is well for any school to select for teachers men who have served time in commercial work for which they are training students. It was also inferred that permission for a teacher to engage in a certain amount of practical, consulting work while teaching would be beneficially reflected in the practical value of his teachings to embryo engineers.

Aerial Photography

"THE type of activity confronting the mining engineer and the petroleum geologist has undoubtedly made him more appreciative of the potentialities of aviation than the hard-boiled financier of the bureaucratic business man," Major E. E. Aldrin, consulting aeronautical engineer, told petroleum delegates at the opening session of the annual meeting of the American Institute of Mining and Metallurgical Engineers in New York, February 14-18.

The meeting was a joint one attended by the petroleum division, the mining

geology committee, and the aviation committee.

Pioneering work is going on daily throughout the world in the realm of transportation by air to remote places and in aerial photography, Major Aldrin told those in attendance. The speaker, incidentally, has selected for 10 years equipment for use in various parts of the world, much of it for Standard Oil Company of New Jersey's use.

The annual cost of a plane just about equals the initial investment, he said.

In speaking of projects far from source of supply of parts, etc., and under weather conditions little known, he stated, the problem may involve factors that will outweigh most others in the selection of aircraft. "As a rule safety should be paramount, even if it means abandoning an aeronautical problem that might be made to operate with reasonably good breaks. Any other approach will lead to difficulties."

An all-purpose type of machine is the most satisfactory compromise for use in a new locality, because the unusual, unforseen requirement is bound to appear. But, in this connection, it must be emphasized, he stated, that no general rule exists. All facts have to be considered.

Speaking of concession work, this thought was stressed: "It is a pretty safe assumption that any of these activities will be in more or less desolate places, where forced landings or accidents may be most precarious. The proximity of supplies will also be bad. Consequently, no experimental or novel equipment is desirable."

The speaker then touched on the necessity of having the equipment, pilots and radio operators licensed in the foreign country in which the plane is going to function.

"Commercial airplanes are not to be bought off the shelf as a finished, standard article ready for any purpose. When the time comes to select equipment, the following questions have to be answered: What is the primary purpose: photography and reconnaissance, freight carrying, or passenger carrying? If the answer is nearly exclusively one of these, the choice is easy. However, sooner or later, the plane may be wanted as an ambulance. This may dictate the need of special width doors, of which extra cost, extra weight, and delays may be serious.

"Should the plane selected be a land plane, a sea plane, or an amphibian? The amphibian offers so much in flexibility that it is difficult to reject it until one considers the cost, initial and maintenance, and pay load. A quickly detachable amphibious, or just the regular float gear offers a happy compromise to consider. All taken together, the land plane should be chosen if landing facilities exist; otherwise, the sea plane."

In outlining the performance requirements of an oil company plane, the speaker brought out that in mountainous operations rough air, high altitude airdromes and many other factors may restrict the choice of a plane. In the case of aerial mapping it may be essential to have a high rate of climb, in addition to the usual stability desired, in order to take advantage of weather and lack of cloudiness.

The wide use of aerial photography and the application of aerial photographs to all phases of geologic mapping was set forth in a paper by Wayne Loel, consulting geologist, on "Use of Aerial Photographs in Geologic Mapping." The paper presented methods of field and office procedure from a geologic point of view, and suggested the best methods of aerial mapping for different uses and under a wide range of field conditions, including submarine geology. Aerial photographs with accompanying geologic maps were shown to illustrate the appearance from the air of different geologic features under varying climatic and topographic conditions.

The paper pointed out that a photograph of the earth's surface can delineate only that which the eye can see; and therefore the geologist should not expect more from an aerial photograph than he would be able to observe, were he in the photographer's airplane and looking at the area to be photographed. Theoretically, if the geologist had sufficient artistic ability, he could draw as good a geologic map from his position in the plane as he could from observation of the aerial photograph. Practically, this can not be done, and the geologist must depend on the photograph.

Before geologizing any territory, the geologist should make a reconnaissance by airplane, the author stated.

Two other papers were presented before the session on aerial geologizing. They were "The Zeiss Wide Angle Aerial Survey Camera," by S. Meyer, vice president, Carl Zeiss, Incorporated, and "The Telechrome Color Photograph Air Survey Camera," by E. W. Albrecht, consulting geodetic engineer and geographer.

A.P.I.

[*Continued from page 45*]

After discussing the procedures in squeezing cementing in open formations, behind casing and blank liners, shutting off gas before running casing and in selective perforation and squeezing, Parsons declared, "there is no general formula that can be applied indiscriminately in the handling of squeeze jobs. An adaptation of the squeeze in a new area with untried conditions should be approached with a background of all the headaches of the past.

"Adequate equipment," he continued, "should be used to handle high pressures. Special cements which will set slowly under high temperature should be used when high pressures are going to be used in deep wells."

Parsons concluded that "carefully handled, squeeze cementing has many useful applications. It already has a proven record of success in many hundreds of wells, thereby eliminating the expense and trouble of producing salt water.

"It also has a fine record of reducing gas/oil ratios in hundreds of other wells, thereby prolonging the natural flowing life of those wells and conserving the invaluable and irreplacable natural energy."

While the last few years have seen more real and substantial improvement in the technique of drilling than all other years combined, the industry still is vastly in need of, and the trend is toward, drilling equipment of design and characteristics more nearly suitable to the work to be accomplished, and machinery that will have a longer useful life and require lower up-keep costs, stated J. E. Brantly, Drilling & Exploration Company, Inc., in a paper entitled "Modern Trends in Rotary Equipment and Drilling."

"There is no sound reason for drilling costs and repair costs exceeding other mechanical operations," he continued. "And, by proper cooperation between

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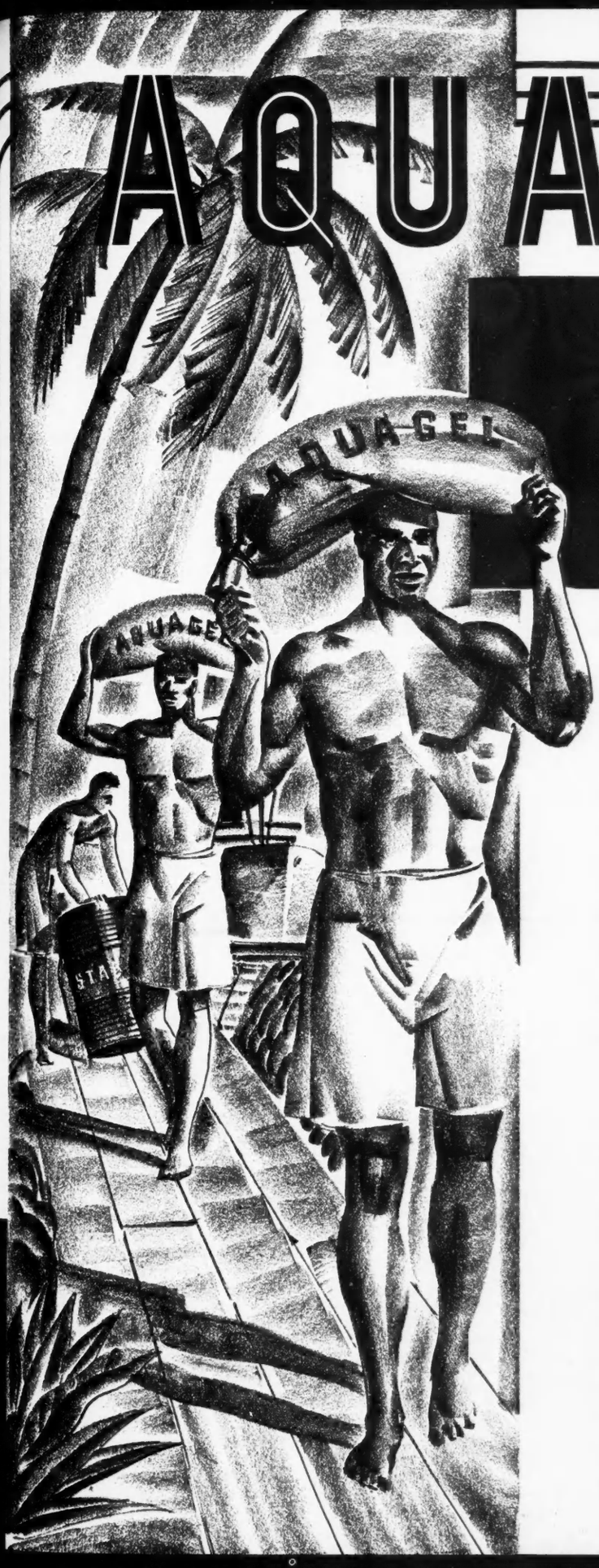

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STABILITE is unexcelled for reducing the viscosities of thick drilling muds and at the same time enhancing their wall-building properties—and for freeing gas. It quickly releases gas from gas-cut muds and maintains a workable viscosity in highly weighted muds. STABILITE presents no hazards in mixing or handling and assures lower mud-treating costs. Sold in 50-gallon drums or in powdered form in 10-pound cans. 100 pounds of powder is equivalent to a 50-gallon drum of liquid STABILITE.

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the operator and manufacturer, a greater efficiency may be reached.

"There may be expected boilers generating a substantially larger weight of steam per pound of boiler, more general use of an improved power pump driven by steam and internal combustion engines and electric motors," in the opinion of Brantley. "Direct-acting pumps may be built with very much larger strokes and larger cylinders and driven hydraulically. Hoists, having friction clutches on the drums or drum shafts, may be expected in the very near future, permitting the more general use of internal combustion engines as prime movers. Further development and use of individual table drives and substantial improvements in the method of joining the lengths of drill pipe may be anticipated. Methods of imparting a steady and regular feed to the bit will be more generally used where problems are difficult. Particularly the knowledge of mud control with its attendant usefulness should be advanced greatly. The use of greater weight concentration above the bit is important to the life of drill pipe and in drilling straight holes. Further studies of rotating speeds and bits should permit their proper applications under the various conditions encountered."

Following his discussion of rotary drilling trends, Brantley and E. H. Clayton collaborated in presenting "A Preliminary Discussion of the Use of Pulverized Limestone as a Rotary Drilling Mud." Their remarks were confined to West Texas and New Mexico experiments, done for the purpose of preventing producing formation contamination if possible. During recent months several wells have been drilled in the region that used pulverized limestone either as an ingredient or as a pure drilling mud, the condition and type of work being criteria for the percentage used. The limestone used was dried and pulverized cement rock.

Limestone, or impure calcium carbonate, though having little if any natural colloidal property, is readily held in suspension by the addition of colloidal material. A one percent solution by weight of highly colloidal material, such as bentonite, will hold sufficient limestone in suspension to build the fluid up to a weight of 98 pounds per cubic foot, though agitation is necessary to prevent settling. At 92 pounds per cubic foot the fluid will not only hold the limestone in suspension without agitation but also retain its thixotropic property. The chalk that seals the pores of the producing zone may be removed by acid treatment, it was stated.

A paper "Application of Electrical Logging Methods to West Texas Problems," by W. J. Gillingham and W. B. Steward, Schlumberger Well Surveying Corporation, showed in detail the application of electrical surveys to geological and engineering problems of West Texas. The examples shown were in the form of graphs taken of wells of the area during the past three years. In West Texas, as elsewhere, electrical, electrical logging permits correlation between wells and a means of differentiating between encountered formations.

Temperature surveys were also discussed, and their use to locate the gas in oil-bearing strata was explained. It was shown that temperature determinates were factors that could be applied as a means of establishing the gas/oil contact. Through this information a casing seat could be determined in new wells, and in old wells that had developed new gas/oil ratios since completion, new zones of production could be determined to reduce the gas volume.

The use of the photo-electric cell as a means of locating water intrusion in pumping wells was explained. The operation of this instrument was described as being dependent upon the changing translucency of fluid in the hole, the exact point of intrusion approaching maximum transparency to give a recording.

G. Raymond, chief engineer for Black, Sivalls & Bryson, presented an illustrated talk on the "Hazardous Use of Old Pressure Vessels in Oil Fields." It was largely pictorial, showing the contrast between old welding methods and new welding methods in the building of pressure vesels. Through simple changes in design, brought about by studies of the forces or actions of pressure, it has been possible to materially strengthen welded vessels

G. O. Lockwood, safety director, Cities Service Oil Company, gave a very comprehensive paper on "Accident Prevention in the Petroleum Industry." In his remarks he showed that a great many of the new devices and processes, while correctly being hailed as industrial advancement, at the same time present new risks to both worker and handler. This phase of accident work is steady growing, and is constantly to be reckoned with. The usual problems are always with us, these being divided into three groups in order of hazard: first, mechanical defects or failures; second, conditions accompanying specific operations; third, human failures.

Lockwood analyzed these fundamental problems, then explained the organization and functioning of a department to prevent accidents, or at least hold the number to an absolute minimum. The various activities and responsibilities of such a department, the duties, authorities, and supervisions and the parts played by the participants were discussed. A list of important points in routine inspection were given, and their relative values indicated.

In concluding, Lockwood pointed out that all activity is accompanied by a certain degree of risk. Industry has done much to reduce its accident toll. With increased interest, the present low accident rate is bound to be even further lowered.

L. K. Covelle, State Supervisor of Trade and Industrial Education, Oklahoma, in his paper on "Vocational Training in the Oil Industry," showed that there are three major factors in the oil game, these being, equipment, material and men. And the problem of training is related to all three factors, rather than to the last, alone.

The spread of industrial education, and the desire for continued expansion of personal knowledge, has lead within recent years to the establishment of a service department devoted to the maintenance of the highest degree of efficiency in man. Programs of instruction, similar to high school and college curriculum, have ben outlined and put into practical application.

For the petroleum industry, it was pointed out that in 1933 at Kansas City, a group of men representing the American Petroleum Institute met with vocational departments of Kansas, Oklahoma and Texas, and that the present program was initiated at that time. Later, a topical sub-committee was named in the institute, and with the functioning and spread of this group, vocational work in the oil industry has become an important human factor. It is through the medium of vocational training that the ultimate in synchronization of materials and men is accomplished for the betterment of both the industry and the individual, himself.

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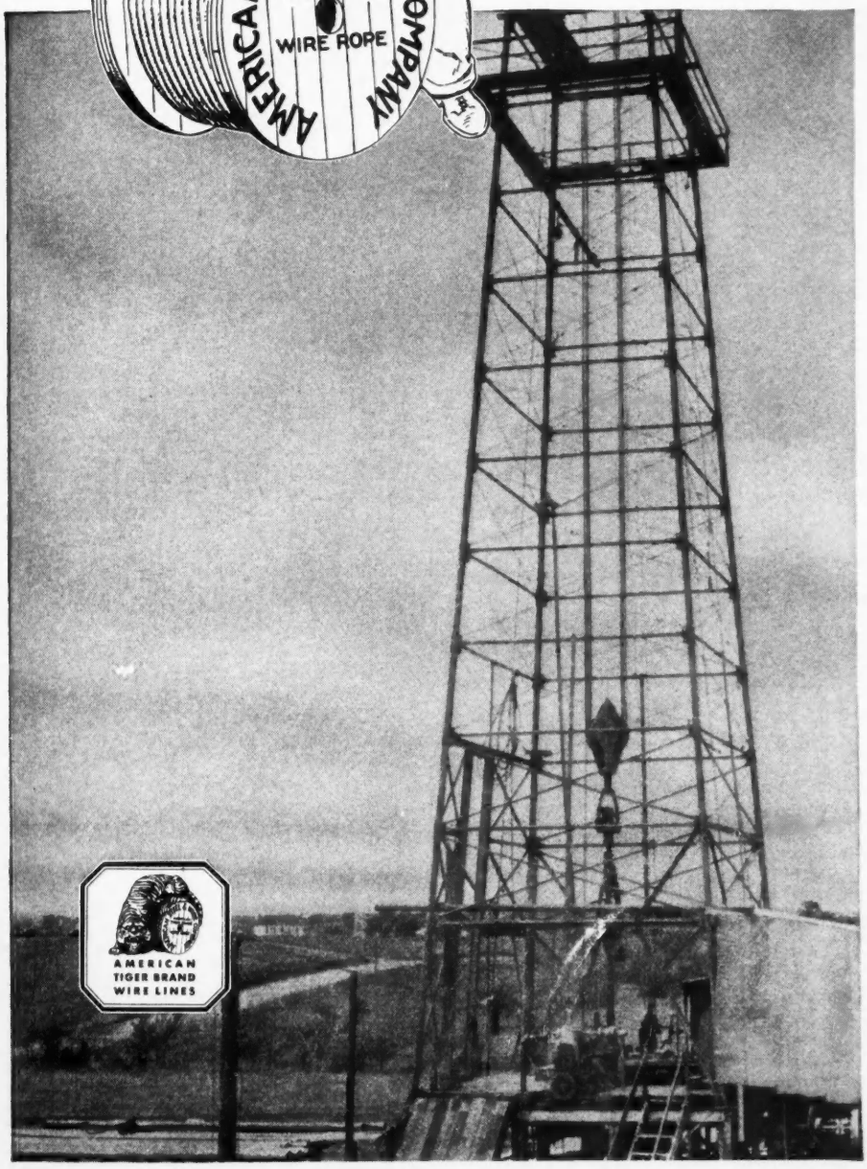

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MEN IN THE INDUSTRY'S NEWS

STUART A. GIRAUD NAMED DIRECTOR AND L. T. BARROW A VICE PRESIDENT OF HUMBLE OIL & REFINING COMPANY

OTHER PROMOTIONS ARE MADE, AS ALL FORMER DIRECTORS AND OFFICERS ARE REELECTED

STOCKHOLDERS of Humble Oil & Refining Company in their annual meeting at Houston February 14 re-elected all directors and added one member to the board. The new director is Stuart A. Giraud, general manager of the company's refining department and manager of sales.

Giraud's first job in the oil industry was working on sales sheets and iron barrel records for Waters-Pierce Oil Company, Houston, Texas, in 1903 and 1904. He later worked as clerk and chief accountant for Rio Bravo Oil Company, for the Gulf companies, for Paraffine Oil Company, Blaffer & Farish, and Humble Oil Company. The latter three companies later were consolidated in the organization of Humble Oil & Refining Company, in 1917, and Giraud has served the latter company continuously, except for a period spent in the field artillery of the army. He entered the refining department in charge of accounting in 1922, and in 1932 assumed, in addition, the duties of manager of sales, in charge of marketing. In March, 1936, he became general manager of the refining department, as well as manager of sales.

Reelected directors of Humble Oil & Refining Company include: R. L. Blaffer, H. C. Wiess, E. E. Townes, James Anderson, John R. Suman, L. T. Barrow, and Hines H. Baker.

In the directors meeting that followed the meeting of the stockholders of Humble Oil & Refining Company, several new offices were created, and officers were chosen to fill them; and all the former officers of the company were re-elected.

L. T. Barrow, head of the geological department and a director, was elected vice president. R. E. Seagler was named to the newly created position of general attorney. James S. Crate was promoted from assistant secretary and assistant treasurer to secretary and assistant treasurer. He succeeds F. O. Freese, who has reached retirement state, provided under the annuity plan for 20 years' service with the company. O. F. Carroll was elected assistant treasurer, and B. P. Barrett, Jr., was named assistant cashier.

Blank-Stoller.

STUART A. GIRAUD

JACK MUCKELROY, drilling superintendent for Heyser, Heard & Clardy, Inc., has been transferred from Victoria, Texas, to Wichita Falls where he will have charge of the company's operations in the K-M-A area.

O. W. KILLAN, discoverer of the first oil production in the Mirando district and one of the most active operators in South Texas, will be honored about February 25 with a banquet in the Gunter Hotel in San Antonio. The definite date has not been set as yet. The oil field and equipment concerns of San Antonio are planning the program, which will be free to the members of the industry, but an invitation affair sponsored by the San Antonio Chamber of Commerce. Amon G. Carter, of Fort Worth, is to be the principal speaker on this occasion.

R. L. KEYES, who has been drilling superintendent of Pacific Coast operations for The Texas Company of California, has been named general superintendent of the company. He succeeds Howard S. Cole, Jr., who has been appointed assistant manager of The Texas Company West Texas producing division with headquarters at Fort Worth.

G. H. KIRKPATRICK was re-elected president and managing director of Amalgamated Oil Company, Ltd., when shareholders held their annual meeting last week in Vancouver, British Columbia. Other officers named were Dr. J. E. Spankie, vice president; Jas. B. Noble, secretary-treasurer, and Robert Bone, Lieut.-Col.; H. S. Tobin, R. H. Tupper and John S. Tait, directors.

PETE HOFFMAN, operator in the Illinois coal basin area, is recovering from a serious attack of pneumonia.

WILLARD H. DOW, president of Dow Chemical Company, Midland, Michigan, has been elected vice president of the National Farm Chemurgic Council to represent industry.

MARTIN HARDMAN, petroleum geologist, was in Flora, Illinois, last week interviewing drilling contractors regarding tests on his acreage in the new Centralia field, Clinton County, Illinois.

WALTER S. CAMPBELL, president of Petroleum Producers' Association of Alberta, discussed the crude oil marketing situation in that province before members of the Toronto (Ontario) Empire Club last week. He told his audience that unless markets and distributing facilities are opened for Turner Valley producers, development of the field will decline, and declared that producers, refiners, railways and governments must get together if the distribution problem is to be solved for the benefit of the Dominion.

EDWARD KENNEY, president of the reorganized Ranchmen's Oil Company, Ltd., and Ralph Will, drilling superintendent for Anglo-Canadian Development & Holding Company, Ltd., are in joint charge of drilling the Ranchmen's wildcat on the High River-Aldersyde structure, Alberta, Canada, to completion, under an arrangement made last week.

EUGENE H. DENTON, former field superintendent for Ohio Oil Company, has been named petroleum engineer for Anglo-Canadian Development & Holding Company, Ltd., Alberta producing company. He is a graduate of New Mexico State College and for the past 12 years has been actively engaged in New Mexico, California, Wyoming and Montana oil fields. In his present connection, he will also serve Anglo-Canadian associated companies.

CHARLES B. McCLINTOCK, consulting geologist and petroleum engineer of Oil City, Pennsylvania, has been appointed visiting lecturer for special courses in petroleum geology being conducted at the University of Pittsburgh. H. C. Cooper, president of Hope Natural Gas Company, and Dr. Lewis L. Nettleton, geophysicist for Gulf Oil Corporation, have been named lecturers.

J. O. ABSHER, inventor of the Absher process for extracting crude oil from the Athabaska tar sands in Alberta, Canada, has returned to California following interviews with New York engineers on details of a program of field development planned to start this spring. Shareholders of Bituminous Sand Extraction Company, Ltd., Alberta company, will meet shortly to discuss the policy of the company in connection with proposed research work to perfect the process.

M. P. HUNTINGTON, divisional engineer for Stanolind Oil & Gas Company at Casper, discussed "Modern Practices in Oil Production" before the annual meeting of the Wyoming Engineers Society held in Casper last week. John Bartram, division geologist for the company, explained a motion picture on "Seismograph Surveying" furnished by the Seismograph Service Corporation.

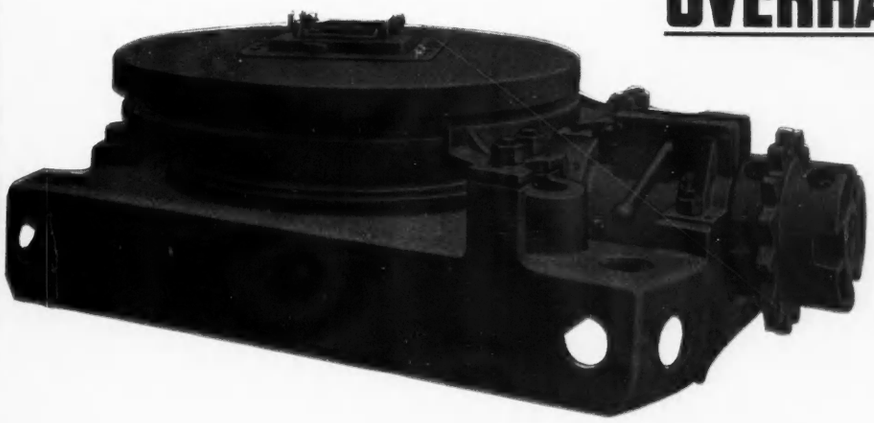
DAN MORAN, president of Continental Oil Company, last week announced an employes' bonus plan for 1938 similar to

for drilling depths up to 3500-4000 feet

GUMBO BUSTER

(JOHNSTON)

ALL STEEL—LIGHT WEIGHT ROLLER BEARING—19 INCH OVERHANGING SPROCKET ROTARY



Here is an inexpensive, especially strong and efficient, 19-inch Rotary designed for average drilling where a comparatively light weight, low cost machine will adequately handle the work.

Like the larger 26-inch Gumbo Buster Rotary, it is built entirely of Steel giving it ample strength combined with light weight which facilitates transportation and installation.

The Main Bearings are Cone Rollers. Roller Pinion Shaft Bearings are spread wide apart, eliminating any likelihood of shaft deflection. The Overhanging Sprocket provides for ease of chain installation and entirely eliminates any chain interference with skids.

The Chrome Nickel Steel Table is 47 inches in diameter with a full 19-inch opening. Weight, complete with Master Bushings and Drive Bushings: 5,150 pounds.

This is the leading low price, light weight, average service Rotary.

Manufactured by THE AMERICAN WELL & PROSPECTING CO., CORSICANA, TEXAS

PRICE $1580.00 Less Bushings—f.o.b. Corsicana, Texas

To Order Telephone Any Bridgeport Store

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The BRIDGEPORT MACHINE COMPANY
Factory and General Offices, Wichita, Kansas

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DALLAS L. D. 584 Local 2-4282

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SHREVEPORT L. D. 15 Local 6481

ODESSA L. D. 683 Local 684

TULSA L. D. 681 Local 5-3204

OKLAHOMA CITY L. D. 785 Local 7-2725

WICHITA L. D. 59 and 116 Local 2-1431 and 2-1432

AND BRANCH STORES

that followed in 1937 when more than $770,000 was distributed to the company's 5076 employes. The 1937 distribution was almost equivalent to a month's pay for each employe.

J. D. CREVLING, president of Panhandle Eastern Pipe Line Company, returned last week from a trip to Europe.

MAURICE MIESSE, scout for Phillips Petroleum Company and a former vice president of the Oklahoma Division, National Oil Scouts Association, was in charge of a dinner dance given in Shawnee February 18.

CHARLES JACOBSON has been placed in charge of the district production office of Barnsdall Oil Company which has been established at Victoria. The office will handle the production of this company in the McFaddin and Placedo districts.

E. C. McCARTY, formerly in charge of Sabine Royalty Corporation's Longview, Texas, office, has been transferred to Wichita Falls, Texas, where the company is opening an office in the City National Building. McCarty will have direct supervision of about 12 producing counties in the North Texas district.

BYRON MEREDITH, SINCLAIR PRAIRIE OIL COMPANY, REELECTED CHAIRMAN OF A. P. I. EAST TEXAS CHAPTER

MAJORITY OF THE OTHER OFFICERS ARE REELECTED ALSO

THE East Texas Chapter of the American Petroleum Institute, Division of Production, reelected the majority of its officers on December 15. Byron Meredith, division superintendent of East Texas and Gulf Coast for Sinclair Prairie Oil Company was reelected chairman.

Two of the three vice presidents were reelected. These were: R. M. Bradbury, Houston Oil Company of Texas, Laird Hill; and M. W. McEvey, independent operator of Kilgore. M. L. Brown, Sun Oil Company, Kilgore, succeeded L. H. Moore, Gulf Oil Corporation, as the other vice president.

W. S. "Buck" Morris, field chairman for the East Texas Engineering Association, Kilgore, was reelected secretary-treasurer. E. B. Miller, Jr., Tide Water Associated Oil Company, Kilgore, succeeded G. P. Brainard, Jr., Shell Petroleum Corporation, as assistant secretary-treasurer.

An advisory committee, with R. D. Risser, Shell Petroleum Corporation, Kilgore, reelected chairman, was elected as follows. R. C. Barbour, Humble Oil & Refining Company, Tyler; C. D. Hubbard, Weaver-Crim Corporation, Laird Hill; R. W. Sole, Arkansas Fuel Oil Company, Longview; C. E. Wharton, Hanlon-Buchanan, Inc., Gladewater; J. E. Springer, Tide Water Associated Oil Company, Greggton; M. C. Sells, Sells Petroleum Company, Longview; W. J. Christian, Railroad Commission of Texas; Kilgore; L. H. Mack, General American Oil Company, Overton; A. W. Martini, Bell and General Pipe Line, Gladewater; A. Lawrence, Empire Oil & Refining Company, Gladewater; Earle Bateman, Bateman Drilling Company, Tyler; and Ira L. Page, Stanolind Oil & Gas Company, Greggton.

The program committee will consist of the following members. W. D. Herring, Herring Report Service, Kilgore; R. M. Bass, Sinclair Prairie Oil Company, Troup; G. R. Kennedy, Magnolia Petroleum Company, Kilgore; and R. R. Kyner, Gas Lift Corporation, Dallas.

The membership committee will have the following members. J. P. Straight, Empire Oil & Refining Company, Gladewater; J. J. Jenkins, drilling contractor, Kilgore; and J. C. Randolph, National Supply Company, Kilgore.

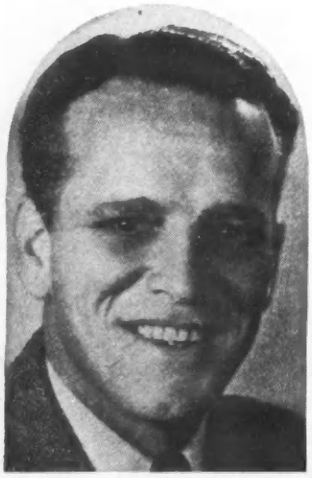
J. R. MUNOZ of New York City, president of Petroleum Finance Corporation, visited the company's district office at Dallas the past week.

W. H. (BILL) MARTIN, assistant superintendent in the Corpus Christi district for Heyser, Heard & Clardy, Inc., has been transferred to Jefferson, Texas. The firm is operating two heavy rotaries at Jefferson.

HUGH R. CULLEN, president of the Quintana Petroleum Company, Victoria Oil Company, and vice president of the G. M. Oil Company, has recently accepted the general chairmanship of a campaign to raise $1,000,000 to build a permanent University of Houston.

DR. E. E. ROSAIRE, head of Subterrex Company, Houston, was the principal speaker at the Houston Geological Society's night meeting, February 17 at the Houston Public Library. His subject was "An Effect of Uplift in the Shallow Overlying Sediments."

BYRON MEREDITH
Chairman



R. M. BRADBURY
Vice-Chairman

W. S. MORRIS
Secretary-Treasurer

R. D. RISSER
Advisory Chairman

M. W. McVEY
Vice-Chairman

HENRY L. DOHERTY HONORED BY AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS

»

AWARD OF LUCAS MEDAL IS IN RECOGNITION OF DISTINGUISHED ENGINEERING CONTRIBUTION

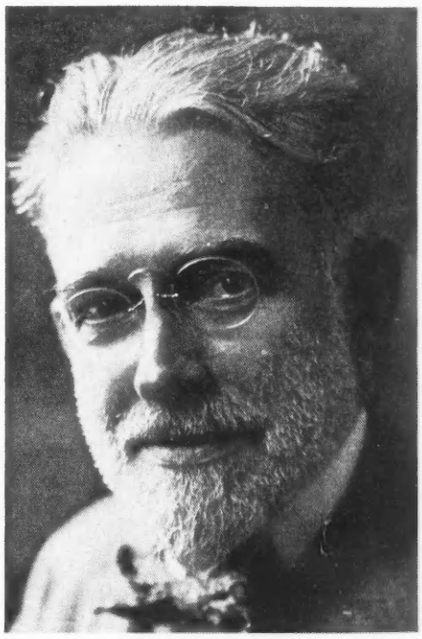
»

HENRY L. DOHERTY, president of Cities Service Company, probably looks upon the night of February 16, 1938, as one of the crowning events of his long and active career. Enfeebled by recent illness to the point where he had to be wheeled on the rostrum in a rolling chair and to where his words of acceptance sounded like a voice from afar, he received at the hands of John R. Suman, vice president of Humble Oil & Refining Company who made the presentation, the highest honor that can be awarded by the American Institute of Mining and Metallurgical Engineers to an oil man, the Anthony F. Lucas medal.

The event took place at the annual dinner of the institute in the Waldorf-Astoria.

Suman, who made the award to Doherty on behalf of the institute for his "recognition of the importance of solubility of natural gas in crude oil and his early advocation of scientific production of oil fields from the standpoint of conservation of energy," touched also upon the start of Doherty's career as newsboy at the age of 10 in Columbus, Ohio, where he was born in 1870, as brought out at the banquet, his career runs something like that of one of the heroes in the old Horatio Alger books.

At 12 he became an office boy with the local gas company and educated himself by studying catalogs and handbooks. By the time he was 20 he had pretty well mastered the problems of the Columbus Gas Company, and for the next 15 years was engineer and manager of public utility companies in Madison, St. Paul, San Antonio, Denver and other cities. In 1905, at the age of 35, he organized the Henry L. Doherty & Company, bankers and operators of public utility corporations, and five years later he organized and has since been president of Cities Service Company, holding company for nearly 200 public utility and petroleum companies, with assets of more than a billion dollars. Doherty was the one, Suman brought out, who logically developed the idea of unit operation of oil pools, with maintenance of reservoir pressure, to secure the largest ultimate recovery from a pool and thus to conserve the country's oil resources.



HENRY L. DOHERTY

S. F. SHAW, consulting engineer, has returned to Oklahoma City from a trip to Ottawa, Canada, where he attended a meeting of the Tariff Board for the Producers Association of Turner Valley.

W. C. KNEALE, former district geologist at Mattoon, Illinois for The Texas Company, has been made production superintendent in the Illinois-Indiana district for the company, with headquarters at Mount Vernon, Illinois. B. Maxwell Miller has been named successor to Kneale at Mattoon.

J. M. CLARK, geologist with Gulf Oil Corporation for the past 11 years, has resigned to join the geological staff of Tide Water Associated Oil Company at Tulsa.

THOMAS A. MANHART, vice president of Seismograph Service Corporation, Tulsa, is on a trip to the interior of Persia, where a seismograph crew has been operating since last November. Manhart's trip will cover more than 10,000 miles.

F. E. WAGONER is in charge of the Coastline Oil Corporation and Lincoln Petroleum Company's offices which have been opened in San Antonio. The headquarters for this organization, which is drilling on submerged lands near Aransas Pass, is in the Alamo National Building.

DELMARVA OIL CORPORATION OF TEXAS, a Delaware concern, has established its headquarters in San Antonio. The concern is represented here by Henry A. Roach.

L. R. VESELEY, geologist with the Amerada Petroleum Corporation in Corpus Christi, is to be transferred to the company's Houston office about March 1 to serve in a similar capacity.

DONALD P. KENYON, head of Kenyon Oil Company of Houston, is moving the general headquarters of that concern to San Antonio. They will be located in the Smith Young Tower.

LEON FOSTER, with Pure Oil Company, Oklahoma City, has been appointed district scout for the company at Ardmore, Oklahoma, succeeding C. E. Barnes, who was transferred to the land department at Tulsa.

W. W. (BILL) PIGUE, for 11 years manager of The Gulf Publishing Company's Pittsburgh office, died at his home in Martin, Tennessee, February 14, following an illness which lasted for more than a year. He was 54 years of age.

Bill Pigue first became associated with The Gulf Publishing Company in the capacity of advertising manager, in 1926. Later he was given charge of one of the company's most important business divisions, and in his capacity of manager of the Pittsburgh office made a host of friends. He retired from active service on account of ill health early in 1937, but retained a consulting position.

Pigue is known to men in the oil business not simply on account of his business connections. As a humorist he was well known and his famous "Letter to a Milkman," published first in THE OIL WEEKLY later saw publication in magazines and newspapers all over the country. Surviving him are his widow, three sons and two daughters.

FRANK COLLINS, executive vice president of The National Supply Company, died at his home in Toledo, Ohio, Saturday, February 12, at the age of 67. He first became associated with The National Supply Company on March 15, 1887, and has taken a most active part in the development and progress of the company during his 51 years of continuous service.

As executive vice president of The National Supply Company and as president of The Toledo Pipe Threading Machine Company, Collins enjoyed a wide circle of friends in the petroleum industry. Despite his many business interests, he participated extensively in Toledo civic affairs. He was very active in the Merchants and Manufacturers Association of Toledo, and gave freely of his time in the liquidation of the Commerce Guardian Savings Bank and Trust Company. As chairman of the building committee of Toledo Hospital, he was instrumental in making this institution one of the most modern hospitals in the country today. He married Florence Fisk, of Toledo, February 11, 1896, and he and Mrs. Collins observed their forty-second anniversary on the day preceding his death.

THOMAS B. GREENE, 73, vice president of Buckeye Pipe Line Company, died February 12 at his home in Lima, Ohio. One of the veterans of the pipe line industry, his association extended back to the early days of that branch of the oil industry. He started in the oil industry as a gauger in the Butler County field, near Petrolia, Pennsylvania. He was at one time with Standard Oil interests and the Eureka Pipe Line Company, and between 1919 and 1933 was general manager and vice president of the Buckeye company. At his request, he was relieved of his duties as general manager less than five years ago and continued as vice president until his death.

M. H. LOBAUGH, 70, retired operator and drilling contractor, died February 11 at Eastland, Texas, where he had resided since 1919. He was a native of Pennsylvania, and drilled in the Eastern States before moving to Texas.

ULRICH LANGHAMMER, 31, sales engineer for Oil Well Supply Company in the Wichita Falls district, died February 12 in Dallas after being ill several months.

ASSOCIATION ACTIVITIES

Mid-Continent A.I.M.E. meets February 25

An open meeting of the mid-Continent Section, American Institute of Mining & Metallurgical Engineers, will be held in Tulsa February 25. Speaker will be Col. Willard T. Chevalier, vice president of McGraw Hill Publishing Company, New York, editor of the Engineering News Record, and in charge of civil engineering, construction and mining publications. His talk, entitled "Now What," will concern problems of engineers in the economic problems of the nation.

Two new A.P.I. production chapters organized

Two new chapters of the American Petroleum Institute's Division of Production have been organized; one at Great Bend, Kansas, known as the Western Kansas Chapter, the other at Coalinga, California, named the Coalinga-Kettleman Chapter.

Fifty-seven representatives of the petroleum and allied industries attended the Great Bend meeting and elected the following officers:

Chairman, Dewey Jordan, The Atlantic Refining Company; first vice chairman, Henry Nething, Stanolind Oil & Gas Company; second vice chairman, George Neylon, Conway-Owens-Neylon Lumber Company; and secretary-treasurer, H. A. Glover, American Manufacturing Company of Texas.

A committee to formulate suggestions and make necessary arrangements for setting up local vocational classes was appointed, with Fred Shelton, of Phillips Petroleum Company as chairman.

Seventy-five representatives of the petroleum and allied industries were in attendance at the initial meeting in Coalinga, and forty-nine joined the organization. After adopting a constitution and by-laws, the following officers were elected:

Chairman, E. P. Campbell, Standard Oil Company of California; first vice chairman, T. R. Tinker, Union Oil Company of California; second vice chairman, W. S. Fisher, Confidence Oil Company; and secretary-treasurer, Harold J. Goldbaum.

An advisory committee was appointed with the following members:

To serve for two years: W. R. Harshbarger, The Texas Company; A. S. Jones, Tide Water Associated Oil Company; J. R. Harmon, Shell Oil Company; C. B. Kimberlin, Kettleman North Dome Association; C. Bevan, Standard Oil Company of California; and J. Farner, Southern California Gas Company.

To serve for one year: D. Stewart, Shell Oil Company; F. Falenzer, Universal Consolidated Oil Company; D. Hoenshell, Kettleman North Dome Association; M. Putnam, Standard Oil Company of California; K. Mehrens, Superior Oil Company; and H. Cassidy, Salvia Oil Company.

Production chapters, organized to provide an open forum for discussion of technical and practical subjects in the oil producing areas, elect their own officers and hold meetings at regular intervals. At these meetings current problems are discussed, particularly as regards the application of engineering principles to drilling and producing operations.

Gulf Coast A.P.I. meets February 28

An interesting program has been planned for the next meeting of the Gulf Coast Chapter of the American Petroleum Institute, Division of Production, which will be held in the Chamber of Commerce auditorium at Houston at 7:30 p.m. February 28, 1938.

The program to be presented will include discussions of the application of gun perforation and squeeze cementing, which operations have advanced so greatly in recent years and have been used successfully to overcome many problems.

The subject "Applications of Gun Perforations" will be presented by M. E. Montrose, manager for Lane-Wells Company at Houston. His talk will be illustrated with both movie pictures and sketches that will show more than 10 applications now being employed widely, and what they will do for the operating company.

R. S. Kail, engineer for Baker Oil Tools Company at Corpus Christi, will deliver the paper on "The Use of Squeeze Cementing." This paper will feature the application of multiple-batch cementing and squeeze cement jobs for the reduction of gas/oil ratios. The paper will be accompanied with stereoscopic views.

In addition to the two technical papapers, Warren L. Baker, editor, THE OIL WEEKLY, will speak on "The Current Situation and News of the Oil Industry."

Entertainment Plans Announced for Foreign Visitors at Exposition

International delegates to the Tenth International Petroleum Exposition, May 14 to 21, at Tulsa, will derive invaluable knowledge from the tours, lectures and discussions that the Foreign Delegates Committee has arranged for them.

J. H. Gardner, president of Gardner Petroleum Corporation, and chairman of the foreign delegates committee, has announced that the delegates will be taken on a comprehensive tour through the refineries, producing fields and tank farms of the Mid-Continent area.

Gardner pointed out the fact that the delegates are assured of an official invitation to attend the exposition by the government of the United States, through a bill passed by Congress and signed by President Roosevelt. Thus, not only will the exhibitors and officials of the oil show accord the visitors a cheerful reception, but the government as well.

Dr. Gustav Egloff, chairman of the scientific and technical committee and director of research for Universal Oil Products Company, Chicago, has announced that one of the most complete displays of scientific equipment, problems, and methods ever seen at an oil show, have been obtained from the Chicago Museum of Science and Industry for the new Hall of Science at the exposition. These exhibits will be made up of maps, dioramas, full-scale models, working models to scale. The display begins with the fundamentals of prospecting, both geological and geophysical. To show how the geophysicist works there are working models demonstrating seismic reflection, torsion balance, the pendulum, induction, and electrical resistivity. Specimens of fossil remains, cores and models of formations portray the things a geologist interprets in his search for oil deposits. Working models show the use of cable and rotary tools, how water flooding is used and what it does, the actions that take place in a refinery, how a modern service station is operated and all of the methods of moving oil from producer to consumer.

Earl Sneed, trustee of Sneed Royal-

Maurice Duperrey, president of the International Rotary Club, Paris, accepts membership in the Foreign Delegates committee of the tenth International Petroleum Exposition, as James H. Gardner, president of Gardner Petroleum Corporation of Tulsa, and chairman of the committee, pins on his badge. Watching the proceedings are: Wm. B. Way, general manager of the tenth oil show, which is to be held in Tulsa, next May 14 to 21, and Madam Duperrey.

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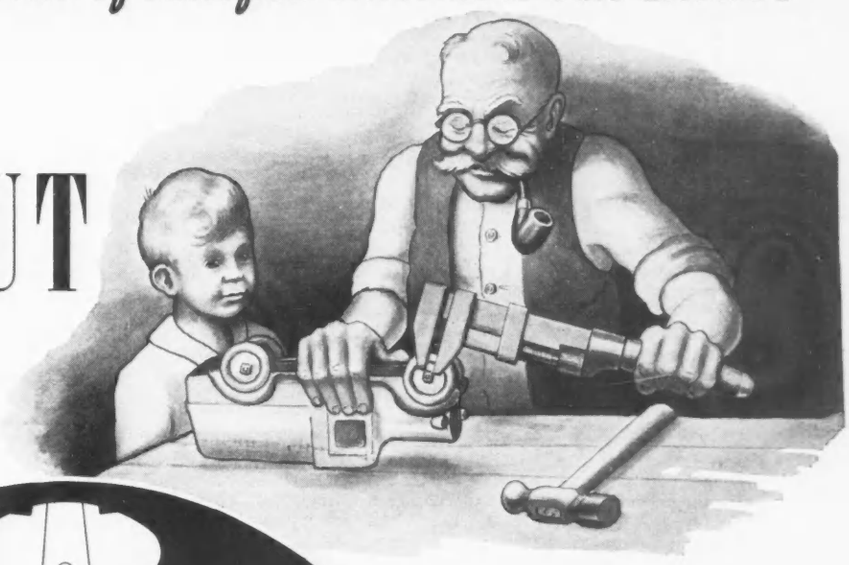

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BECAUSE OF ITS

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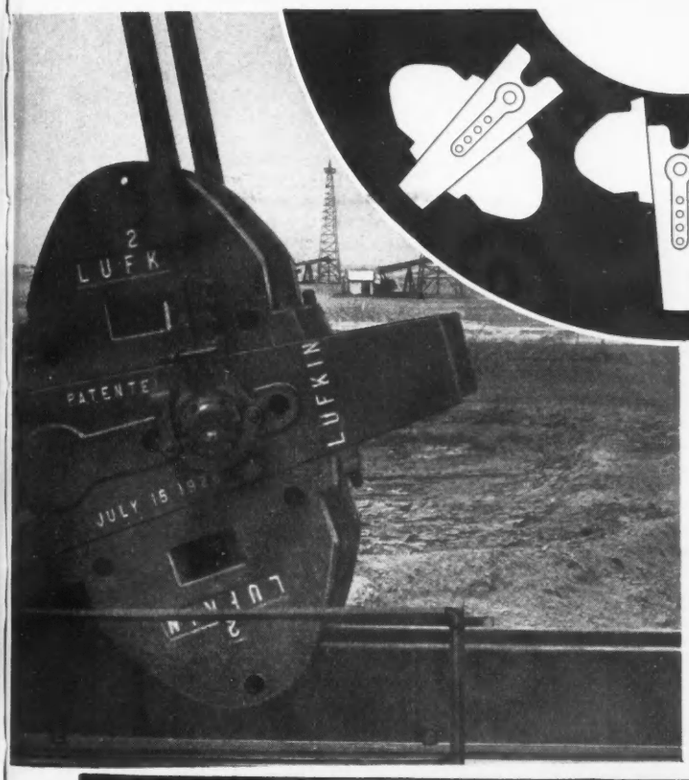
"Easily adjusted to meet all conditions"



FLEXIBILITY . . . has been a prime virtue of the **LUFKIN-TROUT Crank!** . . . Ease of adjustment to any desired position to secure maximum, efficient counterbalance has made the **LUFKIN - TROUT Crank** the "demand" crank of the oil industry! Counterbalance weights, that slide easily upon ways, accurately balance the well within 2-amps. on up or down stroke, and may be moved to neutral position in less than five minutes—nothing to "add to" or "take from" as in the usual "drop weight" type of crank.

Specify Lufkin Units with Lufkin-Trout Cranks. Complete details on request.

Lufkin Cranks are licensed under Patents 1,588,784; 2,071,007; 1,914,387; 2,071,008; 1,599,440; 1,931,861; 2,071,009; 1,979,675; 1,690,376. Others pending.

LUFKIN PUMPING UNITS

Lufkin Units are manufactured in Lufkin, Texas, by the Lufkin Foundry & Machine Company . . . Branches in principal oil centers.

ties and chairman of the housing committee, has announced the appointment of Charles Andrews, affiliated with the 1936 exposition, as manager of the housing bureau of the oil show's housing comimttee. The bureau will handle all plans and correspondence connected with housing visitors to the 1938 exposition. The bureau will definitely see that every visitor has a place to stay in Tulsa.

A. F. Winn, head of the traffic department of Skelly Oil Company, and chairman of the transportation committee of the exposition, has announced that the railroads in this country and steamship lines are providing reduced rates, with an extended time limit on round trip fares, for those who wish to visit the exposition.

W. G. Skelly, president of the exposition, has announced that he has asked the following men to serve as international members on various committees: Dr. N. L. Anfilogoff, Ph.D., F.I.C., European Technical Service, The Texas Company, Brussels, Belgium, has been asked to serve on the scientific and technical committee; Sir Thomas H. Holland, L.L.D., K.C.S.I., K.C.I.E., principal and vice chancellor of Edinburgh University, Edinburgh, Scotland, has been asked to serve on the scientific committee; E. A. Evans, chief chemist for C. C. Wakefield & Company, London, has been asked to serve on the scientific committee; Harold Morre, Morre and George, Ltd., Surrey, England, has been asked to serve on the scientific committee; Dr. J. H. Jones, chief geophysicist for Anglo-Iranian Oil Company, London, has been asked to serve on the exploration committee; G. M. Lees, M.C., D.F.C., Ph.D., chief geologist for Anglo-Iranian Oil Company, London, has been asked to serve on the exploration committee; Cecil W. Wood, F.I.C., editor of Petroleum Times, London, has been asked to serve on the foreign delegates committee; Maurice Duperee, Paris, France, president of Rotary International, will serve on the foreign delegates committee; and L. W. Elliott, general manager of the Dutch East Indies for the Nederlandsche Koloniale Petroleum MaatschappijN.V., Sumatra, will serve on the foreign delegates committee.

Oil papers on Western Metal Congress program

Particular attention will be paid to the petroleum industry and the metals it uses, when the Western Metal Congress is held in the Biltmore hotel and Pan-Pacific auditorium, Los Angeles, March 21 to 25, according to announcement by Dr. Donald S. Clark, program chairman.

Dr. Clark, who is instructor in mechanical engineering at California Institute of Technology, stated the following papers will be given:

"Metals Used in Pipe Line and Pipe Line Station Construction," by L. F. Scherer, assistant chief engineer, Texas Pipe Line Company, Houston.

"Metals Used in Petroleum Production," including well casings, drills, sucker rods and the like, by Harry McQuaid, metallurgist, Republic Steel Corporation, Cleveland.

"Theory and Practice in Pipe Protection," by Gordon N. Scott, pipe line technologist, Los Angeles.

"General Application of Metals in Refining," by R. L. Wilson, metallurgical engineer, Climax Molybdenum Company, Canton.

"Alloy Steel for Tubular Oil Heaters," by R. L. Wilson, metallurgical engineer, Climax Molybdenum Company, Canton.

"Valves for the Petroleum Industry," by George Scherer, chief metallurgist, Merco-Nordstrom Company, Oakland.

"Typical Failures of Still Tubes in Refinery Service," by E. C. Wright, chief metallurgist, National Tube Company, Pittsburgh.

"High Temperature Characteristics as Revealed by Rupture Tests," by W. C. Hildorf, chief metallurgical engineer, Timken Roller Bearing Company, Canton, and C. L. Clark, research engineer, department of Engineering Research, University of Michigan.

"New Developments and Applications of Hard Facing Material," by C. C. Pendrell, Haynes-Stellite Company, Kokomo, Indiana.

With the American Welding Society, Pacific Coast Gas Association and American Society of Mechanical Engineers holding their regular meetings at the same time, these groups also have dedicated much of their programs to metals used in petroleum production.

Some of these papers on the welding program, are announced as:

"Weldability and Properties of Materials for Casing Strings," by Isaac Harter, Babcock and Wilcox Company, New York.

"Field Practice in Welding Casing Strings," Howard Newby, American Pipe and Steel Corporation, Los Angeles.

The program, in large part, was suggested by Professor W. Howard Clapp, of California Institute of Technology, who in so doing represented the American Petroleum Institute, which is one of 18 national technical societies, cooperating in the coming congress.

In addition, an exposition of metals to be held under supervision of the American Society for Metals, in Pan-Pacific auditorium, will feature many exhibits pertaining to the petroleum industry.

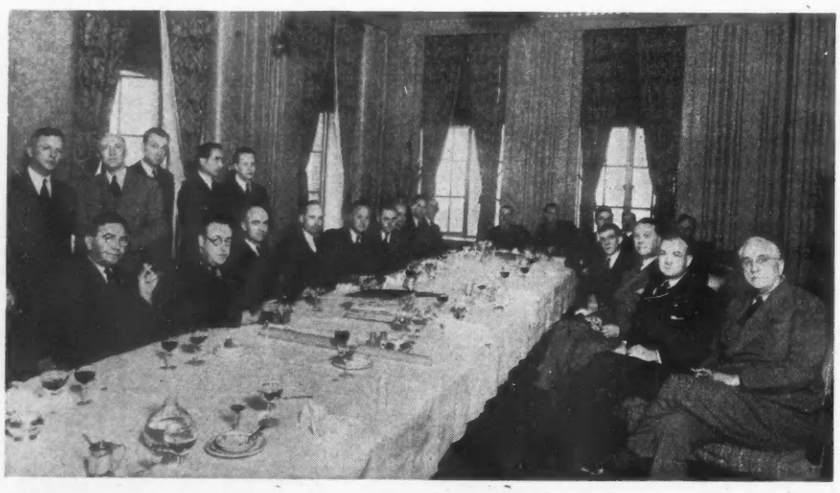
Wichita.—Opposition to a proposed 1-cent a gallon federal tax on fuel oil was voted here February 15 by the Kansas Oil Men's Association. The organization also voted to urge repeal of the present federal tax on gasoline and lubricating oils, and pledged themselves to support the campaign against evasion of the state gasoline tax.

Officers of the association include E. M. Taylor, Kinsley, president; C. E. Holmes, Wichita, secretary, and C. A. Elmborg, El Dorado, treasurer.

Date Announced for 1939 Houston Oil Show

At a meeting of the directors of the Oil-World Exposition held February 10, the date for the next oil show to be held at Houston, was set for April 24 to 29, 1939, inclusive. This action is in accordance with the by-laws of the organization and with the desires of the directors to cooperate with the oil industry by not holding the exposition more frequently than every other year. By unanimous vote the directors appointed Ed G. Lenzner, general managed for the 1939 exposition.

The size of next year's oil show at Houston is to be increased considerably because of the greater demands for space reservations which have been received since the 1937 exposition. An addition to the main exposition building is being constructed to provide additional indoor exhibiting space. This will eliminate the necessity for a tent or other auxiliary buildings and will consolidate the indoor spaces to provide added facilities for exhibitors. A large increase in the outdoor exhibiting space is also being planned to take care of the larger types of equipment and to provide for extensive demonstration work.



Board of Directors' Meeting of Oil-World Exposition Held at Houston Club, February 10, 1938.

JOSEPH BORDEN, geologist for Pure Oil Company, discussed "The Pennsylvanian of the Tulsa Area" before members of the University of Tulsa Geology Club last Thursday night. Officers of the club, which is a new organization, are: George Dunlap, president; Pete Renfro, vice president; Jane Eckle, secretary; Arthur Bowsher, treasurer; Palmer Kise, sergeant at arms, and L. E. Fitts, program chairman. Sponsor of the club is Dr. H. J. Smith, while Drs. A. N. Murray and L. R. Laudon are advisors.

Tending Toward Strength

First time in over four months that gasoline market shows signs of improving; fuel oil is losing some ground

AFTER having become perceptibly steadier in the past few weeks, the oil industry's markets now are tending to show some improvement.

For the first time in 4½ months, tank car prices of gasoline at the refineries last week were trending upward in some districts.

In the East Texas refining district, for example, the tank car prices of gasoline have improved ⅛ cent a gallon. The most common gasoline on the market in that area, 60-62, 400 end-point gasoline, currently is priced from 4⅛ to 4¼ cents a gallon.

In the Chicago market, gasoline tank car prices generally are ⅛ cent a gallon higher than they were ten days ago.

Fuel Oil Prices Lower

In contrast with the improving trend of the gasoline market, the fuel oil market recently has been losing some ground.

Present prices of fuel oil in the Chicago market are, in some instances, ⅛ cent a gallon lower than two week ago.

Gasoline Improvement Encouraging

The recent betterment of the gasoline market is particularly encouraging, as the gasoline situation has represented the principal matter for anxiety in the industry.

And in view of the improving gasoline prices, the whole outlook for the industry in the next few months is considerably brighter.

The prices for most of the other refined products have remained comparatively good throughout the past several months of business recession, and now the gasoline prices promise to be somewhat better. Consequently, there is justification for hope that the established crude oil prices also will remain steady at the present levels.

Crude Control Strict

Contributing much, undoubtedly, to the present relatively stable market situation is the continuing unusually strict control of crude oil production.

The leading oil producing states are pursuing in February programs of production control which probably will result in the maintenance of an effective balance of supply with market demand. It is indicated that during the month, crude oil stocks will remain unchanged, or possibly show some decrease.

Furthermore, there have been some indications that the oil conservation officials will continue the exceptionally strict control of production also in the next several months.

The special regulatory efforts may not be needed more than a few months, as spring will bring the usual seasonal expansion of demand for petroleum products.

Statistics Partially Favorable

The statistics of the oil industry remain partially favorable and partially unfavorable.

As in earlier weeks of this year, crude oil production remains at satisfactory levels. The output of the wells of the country averaged 3,324,500 barrels daily in the week ended February 12. That was only 1.6 percent more than the daily production in the corresponding week of last year. And this production rate was fully justified, as petroleum demand has been running somewhat higher than at this season last year.

Refinery operations also have been moderate lately. Crude oil runs through stills in the week ended February 12 averaged 3,150,000 barrels daily, which was only 4.3 percent more than in the corresponding week a year ago.

Gasoline Stocks at Peak

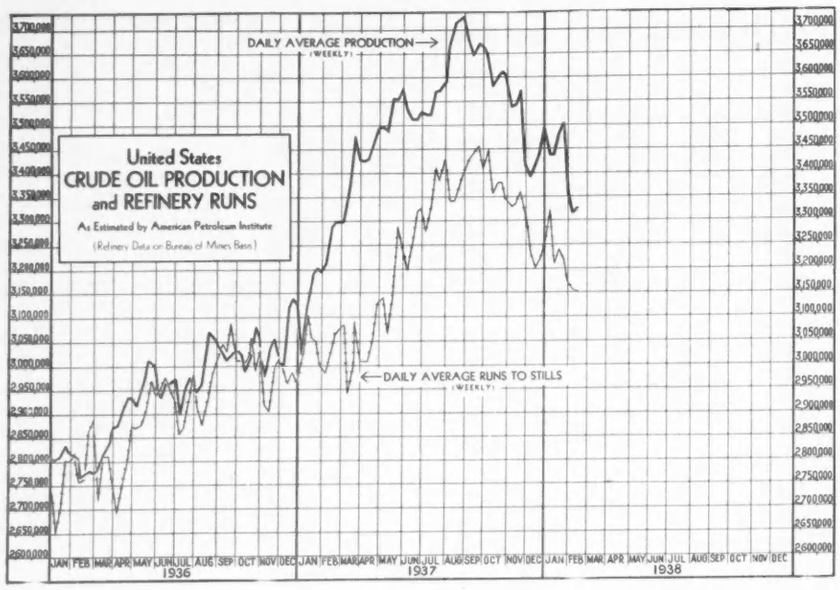
Gasoline stocks in the United States increased nearly 1,500,000 barrels in the week ended February 12, rising to another all-time peak of 87,813,000 barrels. At that level, the gasoline stocks were 19.3 percent greater than on the comparable date last year. This expansion of nearly 20 percent in gasoline stocks within the past year has been only partially justified. For the demand for gasoline lately has been running less than 10 percent above the levels of a year ago. For February, the Bureau of Mines estimated that the domestic demand for gasoline would be

Trends of United States Production and Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	Gas & Fuel Oil Stocks (Barrels)
January 2, 1937	3,121,400	3,030,000	287,659,000	62,661,000	106,330,000
January 30	3,194,050	2,995,000	285,384,000	69,540,000	102,078,000
February 27	3,296,100	3,085,000	288,121,000	78,786,000	99,534,000
March 27	3,431,300	3,060,000	293,587,000	83,538,000	96,591,000
April 24	3,496,400	3,125,000	300,737,000	82,303,000	94,100,000
May 29	3,573,000	3,245,000	306,445,000	78,758,000	96,139,000
June 26	3,529,600	3,235,000	307,679,000	75,427,000	100,395,000
July 31	3,591,900	3,425,000	308,250,000	70,872,000	108,209,000
August 29	*3,731,450	3,425,000	309,506,000	66,997,000	112,111,000
September 25	3,666,300	*3,455,000	307,974,000	65,620,000	116,472,000
October 2	3,647,450	3,400,000	309,036,000	65,266,000	117,076,000
October 30	3,602,950	3,345,000	307,140,000	66,836,000	121,070,000
November 27	3,425,800	3,325,000	304,156,000	68,544,000	121,616,000
December 25	3,492,600	3,245,000	303,294,000	74,437,000	118,659,000
January 1, 1938	3,436,600	3,320,000	303,468,000	77,291,000	118,660,000
January 29	3,357,650	3,170,000	304,286,000	84,844,000	118,793,000
February 5	3,316,450	3,155,000	.....	86,484,000	118,619,000
Feburary 12	3,324,500	3,150,000	.....	*87,813,000	119,293,000
February 13, 1937	3,286,050	3,020,000	†285,384,000	73,585,000	100,735,000
Change in past year	+1.6%	+4.3%	+6.6%	+19.3%	+18.4%

* All time peak. †Stocks January 30, 1937.



only about 3 percent larger than for February last year.

Fuel oil storage also now represents an unfavorable factor. Because of relatively mild weather this winter, the consumption of fuel oil has not been fulfilling expectations. Consequently, fuel oil stocks have been increasing, and in the week ended February 12, they rose 500,000 barrels to 119,293,000 barrels. That was 18.4 percent more than the storage on hand one year previously.

Refinery Prices

U. S. motor gasoline ranged in the Oklahoma market last week about as follows: 62 octane and below 4 to 4¼ cents a gallon; 63 to 66 octane, 4⅜ to 4½ cents; 67 to 69 octane, 4⅝ to 4⅞ cents; and 70 to 72 octane, 4⅞ to 5¼ cents.

Corresponding prices in the Chicago market were as follows: 3⅞ to 4 cents, 4⅛ to 4½ cents, 4⅜ to 4¾ cents, and 4⅝ to 5⅛ cents.

In East Texas the most common gasoline, 60-62 400 end-point, was priced generally at 4⅛ to 4¼ cents a gallon.

Kerosene prices f.o.b. Oklahoma refineries ranged from 4⅛ to 4½ cents a gallon for the 41-43 water white grade, and from 4¼ to 4⅝ cents for the 43-44 water white grade. Corresponding prices in the Chicago market were 4⅛ to 4⅜ cents and 4¼ to 4⅝ cents.

Fuel oil prices were mostly unchanged, although some grades were down ⅛ cent a gallon. In the Chicago market range oil was priced from 4⅛ to 4¼ cents a gallon. The No. 1 white oil was priced from 4 to 4¼ cents, and the No. 1 straw from 3¾ to 4⅛ cents. No. 2 straw was 3⅝ to 3⅞ cents and No. 2 dark from 3½ to 3¾ cents. No. 3 oil was 3½ to 3¾ cents. No. 4 was $1.05 to $1.10 a barrel to domestic consumers and 95 cents to $1.10 to industrial buyers. No. 5 oils were 80 to 85 cents for domestic and 75 to 85 cents for industrial sales. The No. 6 oil was quoted to the usual industrial customers at 52½ to 60 cents a barrel.

Summary of Wells Completed in the United States Week Ending February 19, 1938

	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total, 1938	Total this Date, 1937
Alabama	....	....	....	....	.....	....	.....
Arkansas	5	4	....	1	2,502	34	4
California	22	18	....	4	11,985	176	194
Colorado	....	....	....	....	.....	....	2
Florida	....	....	....	....	.....	....	.....
Illinois	3	2	....	1	238	97	.....
Indiana	1	....	....	1	.....	13	26
Kansas	....	....	....	....	.....	267	301
Kentucky	12	10	1	1	322	101	40
Louisiana	22	16	....	6	9,217	177	78
Michigan	12	10	1	1	942	120	114
Mississippi	3	....	....	3	.....	5	5
Montana	....	....	....	....	.....	....	16
Nebraska	....	....	....	....	.....	....	.....
New Mexico	10	10	....	....	4,833	77	91
New York	3	....	2	1	.....	13	.....
Ohio	14	2	7	5	23	151	242
Oklahoma	....	....	....	....	.....	294	407
Pennsylvania	5	1	4	....	3	36	7
Texas	232	171	8	53	302,972	1,848	1,860
Utah	....	....	....	....	.....	....	.....
West Virginia	16	3	11	2	46	146	113
Wyoming	....	....	....	....	.....	....	12
Total this week	360	247	34	79	333,083	3,573	3,512
Total last week	452	311	43	98	364,825	....	.....
Total this year	3.573	2,396	353	824	2,932,181	....	.....

CRUDE OIL PRICES

Complete tables of prices paid for crude oil at the well in principal fields is shown on page 58 of the issue of February 7. This schedule will appear only in the first issue of each month.

Bureau reports natural gasoline increase

December production of natural gasoline totaled 180,810,000 gallons, compared with 177,114,000 gallons in November, bringing the total for the year to 2,039,100,000 gallons, against 1,796,340,000 gallons in 1936, it was reported this week by the Bureau of Mines.

Daily average production for the month was 5,833,000 gallons, a decline of 71,000 gallons from the November figure of 5,904,000 gallons, but the daily average for the year, 4,487,000 gallons, was 679,000 gallons above the 1936 average of 4,908,000 gallons.

Principal decreases in output registered during the month were in the Panhandle, Oklahoma City and Ketleman Hills fields, the bureau reported.

Total stocks decreased 16,338,000 gallons during the month, those at refineries dropping from 112,140,000 to 106,428,000 gallons and those at plants and terminals declining from 104,034,000 to 93,408,000 gallons, it was stated.

Enlarging Michigan pipe line system

Mt. Pleasant, Mich.—Besides announcing plans for construction this spring of 13 miles of 6-inch from its Greendale station into the new Edenville district, Simrall Pipe Line Corporation, and its affiliate, the Michigan-Toledo Pipe Line Corporation, this week started construction on looping with 8-inch the 28 miles between Mt. Pleasant and Crystal stations on the main Toledo line. Berea Construction Corporation has the latter contract, except ditching which is being done by Shamrock Construction Company, of Mt. Pleasant.

Comparison of Permits Granted for New Wells

STATE	Week Ending Feb. 19	Total this Mo.	Total this Year	Total this Date Last Year	1937 Year Total
Arkansas	4	18	39	10	240
California	27	57	182	176	1,584
Louisiana	27	104	191	127	1,227
Kansas	....	66	267	308	2,663
Michigan	17	25	80	122	958
Oklahoma	....	78	294	346	2,711
Texas	318	933	2,011	2,200	17,238
Total	393	1,281	3,064	3,289	26,621

Production Turns Upward

Oklahoma comes back with substantial gain; Texas added wells swells output, but total still below figure set by Bureau of Mines estimate

DESPITE continued efforts by some of the leading oil producing states, to curtail production the daily output during the week ended February 19, rose again 26,600 barrels a day. The average production for the week was 3,346,650 barrels which was 92,150 barrels less than the indicated market for February.

Responsible for the last week's increase in production was Oklahoma in particular, and followed by Texas. California, Louisiana and Kansas showed small declines in their daily output.

Oklahoma last week averaged 532,300 barrels daily, which was 21,175 barrels a day more than in the previous week, 37,400 barrels less than the Bureau of Mines recommendation, but remained 32,300 barrels above the state allowable.

Texas showed an increase of 8300 barrels, the daily output having been 1,239,700 barrels, which was 126,000 barrels less than the Bureau of Mines estimate and 165,540 barrels less than the allowable prescribed by the state.

California output was down 3000 barrels at 735,500 barrels daily, exceeding the federal allocation and the recommendation of the Central Committee of California Oil Producers 41,800 barrels.

Louisiana likewise showed a small decline of 1725 barrels, having averaged 253,175 barrels a day. That was 13,775 barrels more than the Bureau of Mines recommendation, but 8475 barrels less than the state allowable.

Kansas last week averaged 178,800 barrels, having decreased its production 500 barrels a day. The excess of this production over the Bureau of Mines estimated demand and the state allowable was 2400 barrels daily.

Crude runs to stills up 11 percent in 1937

Washington, D. C.—Receipts of crude petroleum at refineries in December totaled 97,949,000 barrels, of which 95,557,000 barrels was domestic and 2,392,000 barrels foreign, a daily average of 3,160,000 barrels, it was reported February 16 by the Bureau of Mines.

Crude runs to stills for the month were 98,363,000 barrels, the daily average of 3,173,000 barrels being 148,000 barrels below that of November; fuel and losses totaled 203,000 barrels.

With runs to stills at a higher level than receipts, there was a decrease in crude stocks from 51,658,000 barrels on December 1 to 51,041,000 barrels at the close of the month.

Total crude runs in 1937, the bureau announced, were 1,183,440,000 barrels, or 11 percent above the 1936 total of 1,068,570,000 barrels.

BRISTOL HACKBUSCH, who during the past summer has been doing geophysical work in Illinois for Porter and Blanchard, has returned to San Antonio and has established offices at 726 Alamo National Building.

United States Crude Oil Production
Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Recommendation (Daily in Feb.)	State Allowable in February	BARRELS DAILY FOR WEEK ENDING February 19	BARRELS DAILY FOR WEEK ENDING February 12
TEXAS—				
Texas Panhandle	.....	.....	64,100	60,200
North Texas	.....	.....	63,500	63,100
West Central Texas	.....	.....	26,700	30,300
West Texas	.....	.....	178,500	177,500
East Central Texas	.....	.....	91,100	90,400
East Texas Field	.....	.....	425,200	424,800
South Texas	.....	.....	206,700	204,700
Texas Gulf Coast	.....	.....	183,900	180,400
Total Texas	1,365,700	1,405,240	1,239,700	1,231,400
CALIFORNIA—				
Long Beach	.....	.....	58,000	58,500
Santa Fe Springs	.....	.....	40,000	41,500
Huntington Beach	.....	.....	35,500	35,500
Dominguez	.....	.....	29,000	29,000
Inglewood	.....	.....	16,000	15,500
Ventura Avenue	.....	.....	37,000	35,500
Seal Beach	.....	.....	9,500	9,500
Midway-Sunset	.....	.....	77,000	80,000
Elwood	.....	.....	7,500	7,700
Kettleman Hills	.....	.....	78,000	81,000
Mountain View	.....	.....	14,000	14,000
Playa del Rey	.....	.....	7,000	7,200
Wilmington	.....	.....	93,000	90,500
Others	.....	.....	234,000	233,100
Total California	693,700	*693,700	735,500	738,500
OKLAHOMA—				
Oklahoma City	.....	.....	117,200	100,000
Seminole Area	.....	.....	103,050	103,500
Crescent	.....	.....	8,175	7,500
Lucien	.....	.....	11,700	11,500
Fitts	.....	.....	65,025	64,175
Edmond	.....	.....	10,400	9,900
Moore	.....	.....	8,350	7,100
Others	.....	.....	208,400	207,450
Total Oklahoma	569,700	†500,000	532,300	511,125
LOUISIANA—				
North Louisiana	.....	.....	77,075	78,600
South Louisiana	.....	.....	176,100	176,300
Total Louisiana	239,400	244,700	253,175	254,900
KANSAS—				
Ritz-Canton	.....	.....	6,575	6,600
Chase	.....	.....	5,675	5,725
Hollow-Nikkel	.....	.....	3,400	3,500
Sedgwick	.....	.....	4,050	4,025
Burrton-Haven	.....	.....	11,075	11,275
Lorraine	.....	.....	2,900	2,300
Russell County	.....	.....	28,300	28,800
Silica—West	.....	.....	16,100	15,425
Silica—South	.....	.....	2,950	2,650
Others	.....	.....	97,775	99,000
Total Kansas	176,400	176,400	178,800	179,300
NEW MEXICO	105,100	105,100	105,900	106,000
MICHIGAN	52,800	.....	50,200	49,400
ARKANSAS	36,800	.....	48,075	47,125
MOUNTAIN STATES—				
Wyoming	51,800	.....	46,500	47,100
Montana	12,400	.....	13,900	14,800
Colorado	4,400	.....	4,300	4,200
Total Rocky Mountain States	68,800	.....	64,700	66,100
EASTERN STATES—				
Pennsylvania Grade	.....	.....	79,700	77,500
Southern Illinois (New Pools)	.....	.....	27,200	26,100
Illinois-Indiana (Old Pools)	.....	.....	10,500	10,200
Others, Eastern	.....	.....	20,900	22,400
Total Eastern States	130,000	.....	138,300	136,200
Total United States	3,438,800	.....	3,346,650	3,320,050

* Recommendation of Central Committee of California Oil Producers.
† Temporary emergency order issued by State Corporation Commission, February 9

Bureau Reports U. S. Crude Output in 1937 at Peak

DESPITE a steady decline in daily average production during the last four months of the year, output of crude oil in 1937 reached a new high figure of 1,277,653,000 barrels, an increase of 178,000,000 barrels over the 1936 production of 1,099,687,000 barrels, it was disclosed February 8 by the Bureau of Mines.

Output for December was reported by the bureau as 106,579,000 barrels against 104,206,000 barrels in November and 97,723,000 barrels in December, 1936, the increase from November to December being due entirely to the additional day in the latter month, since daily average output in the same periods declined from 3,473,500 barrels to 3,438,000 barrels.

The December daily average was the lowest for any month since last March, and represented a drop of 274,600 barrels from the all-time high of 3,712,600 barrels recorded in August. The actual daily average was 53,300 barrels under the demand of 3,491,300 barrels forecast for the month by the Bureau of Mines, and was the second successive month in which output failed to exceed the forecast.

The decline in output in December was well distributed among the states, only a few of which registered increases, the bureau reported. The largest decline in daily average production was 17,500 barrels, recorded in Texas, the next largest being 10,300 barrels in Oklahoma. California output continued to increase, although the gain in December was small. Louisiana and New Mexico made small gains, but production in Kansas declined for the fifth successive month; production in Arkansas was off slightly despite a material increase in the Schuler area.

"The pressure to reduce crude runs to relieve the gasoline-stock situation apparently bore fruit in December, as the daily average throughput declined from 3,321,000 barrels in November to 3,173,000 barrels," the bureau commented. "As this decline was far larger than that in production, the situation as regards crude-oil stocks changed from one of material withdrawals to small additions. The net change for 1937 was an increase of about 17,500,000 barrels, the total on hand December 31, being 306,084,000 barrels."

Indicated domestic demand for motor fuel for the month was 39,457,000 barrels, a daily average of 1,273,000 barrels which was slightly under the demand of the preceding year, largely, it was explained, because December, 1937, was generally colder and lacked the speculative buying of December, 1936. The domestic demand for 1937 was 518,760,000 barrels, or eight percent larger than in 1936. Stocks of gasoline increased 6,362,000 barrels in December, reaching a total of 76,990,000 barrels at the close of the year, compared with 62,914,000 barrels on hand at the end of 1936.

"The trend in yields of refined products continued to reflect principally the growing importance of heating oils, the yield of gas oil and distillate fuels rising from 13.3 in November to 13.8 in December and the gasoline yield declining from 44 to 43.9 percent. The total demand for gas oil and distillate fuels increased 20 percent in 1937 over 1936," the bureau explained.

Supply and Demand of All Oils

(Thousands of barrels of 42 gallons)

	Dec., 1937	Nov., 1937	Dec., 1936	January-December 1937	January-December 1936[1]
New Supply:					
Domestic production:					
Crude petroleum	106,579	104,206	97,723	1,277,653	1,099,687
Daily average	3,438	3,474	3,152	3,500	3,005
Natural gasoline	4,305	4,217	4,019	48,550	42,770
Benzol[2]	151	178	247	2,786	2,502
Total production	111,035	108,601	101,989	1,328,989	1,144,959
Daily average	3,582	3,620	3,290	3,641	3,128
Imports:[3]					
Crude petroleum:					
Receipts in bond	138	147	266	1,912	2,528
Receipts for domestic use	2,254	2,278	2,348	25,572	29,799
Refined products:					
Receipts in bond	1,709	1,378	1,397	22,352	18,639
Receipts for domestic use	506	279	921	7,316	6,138
Total new supply, all oils	115,642	112,683	106,921	1,386,141	1,202,063
Daily average	3,730	3,756	3,449	3,798	3,284
Increase in stocks, all oils	2,319	[4]1,470	[4]3,663	45,340	[4]22,685
Demand:					
Total demand	113,323	114,153	110,584	1,340,801	1,224,748
Daily average	3,656	3,805	3,567	3,673	3,346
Exports:					
Crude petroleum	5,516	6,645	3,666	67,686	50,313
Refined products	7,033	9,814	6,506	105,127	81,681
Domestic demand:					
Motor fuel	39,457	42,666	39,590	518,760	481,606
Kerosene	6,420	5,705	6,148	54,951	51,428
Gas oil and distillate fuels	15,828	11,639	14,251	117,377	102,757
Residual fuel oils	27,636	26,057	28,255	324,437	307,884
Lubricants	1,489	2,037	1,821	23,374	22,323
Wax	77	78	102	1,044	1,077
Coke	506	347	555	5,765	6,266
Asphalt	816	1,507	1,079	22,936	20,595
Road oil	162	276	193	8,008	7,279
Still gas	4,872	4,876	4,784	61,296	57,046
Miscellaneous	158	142	165	2,249	2,099
Losses	3,353	2,364	3,469	27,791	32,394
Total domestic demand	100,774	97,694	100,412	1,167,988	1,092,754
Daily average	3,251	3,256	3,239	3,200	2,986
Stocks:					
Crude petroleum	306,084	305,747	288,579	306,084	288,579
Natural gasoline	4,758	5,147	4,055	4,758	4,055
Refined products	253,144	250,773	226,595	253,144	226,595
Total, all oils	563,986	561,667	519,229	563,986	519,229
Day's supply	154	148	146	154	155

[1] Final figures. [2] From Coal Division. [3] Imports of crude as reported to Bureau of Mines; all other imports and exports, from Bureau of Foreign and Domestic Commerce. [4] Decrease.

U. S. supply plentiful

Recent predictions that the petroleum resources of the country will be exhausted within a very few years have been received with considerable doubt in Washington, where observers interested in the industry point out that the cry of "Wolf" has been raised many times in the past.

While the prediction will be used in support of contentions that the use of oil must be surrounded with every possible safeguard, such as the Boland bill for a tax on fuel oil for heating purposes, more impartial interests are confident that the last discovery of new oil supplies is far in the future.

As evidence of the fact that the country has repeatedly been scared in the past, Russell B. Brown, general counsel of the Independent Petroleum Association of America, this week compiled a schedule of the predictions of the past 20 years, starting with that of David T. Day in 1908 that the oil resources of the country ranged from a minimum of 8,500,000,000 barrels to a maximum of 22,500,000,000 barrels.

Since that time, Brown pointed out, there has been a production of more than 18,165,000,000 barrels.

Other estimates cited in the association's review were those of Ralph Arnold in 1914, placing estimated future production at 5,700,000,000 barrels; the Geological Survey in 1915, placing it at 7,600,000,000 barrels; certain petroleum geologists of the A.A.P.G. in 1921, of 9,150,000,000 barrels; the "Committee of Eleven" in 1925, at 5,300,000,000 barrels from proven acreage; the petroleum administrative board of the Interior Department in 1935, estimating reserves of recoverable oils at 10,763,000,000 barrels; and the American Petroleum Institute, placing proven reserves in 1935 at 12,177,000,000 barrels and in 1937 at 13,063,000,000 barrels.

"The fact that production soon exceeded all the early estimates," Brown explained, "is no reflection upon those making them but merely illustrates the difficulty if not the impossibility of accurately forecasting the amount of recoverable oil which may be discovered in this country."

Humble Oil & Refining Company reports good year

Humble Oil & Refining Company and its wholly owned subsidiary, Humble Pipe Line Company, in 1937 made capital expenditures of $69,473,000, stockholders were informed at the annual meeting at Houston February 14; and the company during the year substantially increased its underground crude oil reserves. This information was given out by H. C. Wiess, president.

Wiess stated to the stockholders that final figures were not available on the company's operations in 1937, but that business was substantially larger than in 1936, affording a "satisfactory year." He also anticipated "a reasonably good year" in 1938.

The regular quarterly dividend of 37½ cents a share was declared by the directors, following the stockholders meeting. The dividend will be paid April 1 to stockholders of record March 2, 1938.

In 1937 the Humble Company paid only the 37½ cent regular quarterly dividend in each of the first two quarters of the year, but in each of the last two quarters, 25-cent extra dividends were paid in addition to the regular quarterly payments. Thus for all of 1937, dividends totaled $2 a share.

General Conditions

"The most significant fact affecting the oil industry in 1937," stated Wiess, "was the extraordinary demand for petroleum products. Total consumption of crude and products was 9.77 percent greater than in 1936. However, even in the face of this extraordinary demand, too much crude oil was produced and excessive amounts were run through refineries, with the result that for the first time since 1933, stocks were increased. The total accumulation aggregated 45,000,000 barrels, or at an average daily rate of 125,000 barrels. About 60 percent of this accumulation was in the form of products and 14,779,000 barrels of the total amount was of gasoline. While there was some increase in Humble's stocks there was no excessive accumulation.

"As we entered 1938," Wiess continued, "the industry was handicapped by the 1937 accumulation of stocks and by a business recession of unknown proportions. While the consumption of crude and products today is slightly higher than at this time a year ago, the demand is not so great as we estimated a few months ago that it would be today. Conservation agencies have recently made sharp curtailments in allowable production, which have, of course, affected our own production. We are not able at this time to foresee to what extent the industry will overcome the handicaps with which it entered the year. However, we hope for and anticipate a reasonably good year."

Crude Reserves Increased

The most important oil field discovery of the Humble Company in 1937, stated Wiess, was Friendswood in Harris County. Other new discoveries included North Crowley and Lirette in South Louisiana. Fields discovered in 1937 in which the company participated included Clam Lake, in Jefferson County, Texas Gulf Coast; Opelika, Henderson County, eastern Texas; and Avoca, Jones County, West Central Texas. The company made important extensions at Anahuac field, Hastings, Tomoconnor, Talco, and Cummins-Goldsmith, adding substantially to the company's reserves.

Production Larger

Humble in 1937 produced 63,563,000 barrels of oil, of which the company's part was 50,611,000 barrels, or a net daily average of 138,660 barrels, compared with 111,337 barrels in 1936.

The company at the end of the year was operating 5668 wells, or 1075 more than a year previously. It also was interested in 2068 wells operated by others.

In 1937 the company drilled 1271 wells, of which 119 were dry holes; while 128 part-interest wells were drilled by others.

The company in 1937 purchased 83,208,000 barrels of crude oil, a daily average of 227,967 barrels, compared with 164,760 barrels daily in 1936.

Humble Pipe Line Company in 1937 transported 151,840,000 barrels of oil, or 416,000 barrels daily, compared with 331,000 barrels a day in the previous year.

The increased volumes of oil handled necessitated the building of 479 miles of gathering lines and 290 miles of trunk lines.

Runs to refineries for 1937 totaled 146,500 barrels daily, compared with 128,600 barrels a day in 1936.

Refinery Work

Various new construction projects were completed and put into operation at the Humble company's refinery at Baytown, near Houston, and at its plant at Ingleside, near Corpus Christi, Texas.

The company's production of natural gasoline increased substantially during the year.

The sales department showed increased volumes of business. Over-all sales of petroleum products reached over 87,000,000 gallons, an increase of 10.88 percent over 1936 sales. Gasoline constituted a large part of the sales. But sales of aviation gasoline amounted to 1,039,236 gallons, a gain of 26.27 percent for the year, the largest percentage of increase in any sales product.

Service stations in operation at the end of the year numbered 282, and bulk stations 124.

At the end of 1937, the Humble oil and pipe line companies had 13,732 employes, compared with 12,949 a year before. The total payroll of the two companies for 1937 amounted to $28,000,000 and $1,923,000 additional was paid as commissions to sales agencies. While the number of employes increased 6 percent, the amount of money disbursed in payrolls increased 22 percent.

Southwestern Gas Measurement Short Course April 19-21

Norman, Okla.—The executive committee of the Southwestern Gas Measurement Short Course has made definite plans for the 1938 school.

Gilbert Estill, Oklahoma Natural Gas Company, Tulsa, who is general chairman of this committee, presided during the morning session, and L. G. Rheinberger, Sinclair Prairie Oil Company, Tulsa, chairman of the program committee, presided in the afternoon.

The dates for this year's Short Course were set for April 19, 20 and 21.

The committee approved the recommendation that a bulletin of the proceedings of the 1938 school be published, and a copy of this bulletin be mailed to each person who registers for the school.

G. W. McCullough, Phillips Petroleum Company, Bartlesville, was ap-

Southwestern Gas Measurement Short Course executive committee in session. Front row, left to right: W. H. Carson, L. G. Rheinberger, Miss Kate A. Niblack, A. M. Crowell, R. D. Hanley, J. H. Satterwhite, Gilbert Estill (at desk). Back rows, left to right: E. H. Poe, R. D. Turner, W. F. Lowe, R. L. Rountree, G. W. McCullough, C. A. Gibson, W. R. McLaughlin, G. B. Lane, Earl Kightlinger, Norris Plank, R. M. Schofield.

pointed chairman of the publication committee. J. H. Page of the gas department of the Kansas Corporation Commission was unanimously elected a member of the executive committee.

Other members of the executive committee are: W. H. Carson, University of Oklahoma, Norman, chairman of banquet, entertainment and local arrangements committee; R. D. Hanley, Magnolia Petroleum Company, Dallas, Texas, chairman of exhibits committee; Miss Kate A. Niblack, Oklahoma Utilities Association, Oklahoma City, chairman of registration and publicity committee; and Earl Kightlinger, Arkansas Louisiana Gas Company, Shreveport, Louisiana, chairman of practical methods committee.

Other committee members are: E. M. Myers, Corporation Commission, Oklahoma City; A. M. Crowell, Texas Railroad Commission, Austin; E. H. Poe, secretary of Natural Gas Department of American Gas Association, Dallas; William F. Lowe, secretary of Natural Gasoline Association of America, Tulsa; J. H. Satterwhite, American Meter Company, Tulsa; W. R. McLaughlin, Pittsburgh Equitable Meter Company, Dallas; G. B. Lane, Foxboro Company, Dallas; George P. Bunn, Phillips Petroleum Company, Bartlesville; Max Watson, Canadian River Gas Company, Amarillo; Fay C. Walters, Panhandle Eastern Pipe Line Company, Kansas City; R. L. Rountree, United Gas Public Service Company, Houston; C. A. Gibson, Cities Service Gas Company, Bartlesville; Norris Plank, Shell Petroleum Company, Tulsa, and R. M. Schofield, Lone Star Gas Company, Dallas.

The next meeting will be held at the Biltmore Hotel in Oklahoma City during the Annual Convention of the Oklahoma Utilities Association on March 21, 1938, when Mr. Rheinberger will present the program for approval. Other routine business will also be definitely planned at that time.

First well to be drilled in New Guinea

Drilling operations will shortly begin on New Guinea's first oil well. About 30 geologists are now seeking suitable sites in the concession area held by the Netherlands New Guinea Petroleum Company, a joint enterprise of the three major oil companies operating in the Netherlands Indies, two of which are controlled by American capital.

It is reported that the Netherlands New Guinea Petroleum Company has also spent about f.6,000,000 in surveying the concession of 10,000,000 hectares which it holds from the government. A further f.8,000,000 will be spent on exploration work during 1938.

RICHARD L. MANNEN, for several years connected with the United Geological Survey and also as geologist with Sinclair Prairie Oil Company, has been made president of Standard Oilfield Statistics, Inc. The new concern has established general offices in the Bedell Building in San Antonio. Its prime purpose is to provide standardized information concerning oil and gas fields of the Mid-Continent district to the industry. The concern's first service is New Field Service, a complete report on each new field uncovered in Oklahoma, Kansas, New Mexico, Louisiana, Arkansas and Texas.

Proration Picture

[*Continued from page 41*]

Active opposition is expected from operators in stripper areas, following the suggestion that unprorated fields should bear part of the reduction. Stripper areas have an allocation of 164,507 barrels of oil daily, approximately one third of the present allowable. Another plan suggested horizontal reduction of all prorated pools.

Canadian freight-tariff parley makes no progress

Little progress was made in efforts of representatives of the Alberta government and Turner Valley producers to obtain reduced freight rates on crude shipped to East Canadian and West Coast points when they met with representatives of the railways between sessions of the Federal Tariff Board's hearing at Ottawa, J. J. Frawley, counsel for the Alberta government, told the board last week.

The board resumed its investigation of the Canadian oil industry February 14, but later adjourned until April 4 to permit producers and representatives of the Alberta government to confer with railway officials in Montreal. The inquiry was authorized by Dominion Finance Minister Dunning following protests of Alberta operators that major companies were continuing purchases of United States crude and not providing a market for the growing production of the Turner Valley field. The hearing opened late in January in Calgary, Alberta, and during the past two weeks was continued at Ottawa.

Frawley told the board that it was doubtful if anything could be gained by pressing the rate question now, declaring "The railway companies are very shy." He expressed a belief that more could be accomplished by going to the railways' head offices at Montreal rather than to attempt to work through railway company representatives at the hearing. George Walker, K. C., general solicitor for the Canadian Pacific Railway, declared that the only place for a formal discussion of freight rates was before the Board of Railway Commissioners, but he agreed to informal conferences on the question.

A report of Dr. George G. Brown, professor of petroleum engineering at Michigan State University, was presented by Walter S. Campbell, president of the Alberta Petroleum Producers' Association. It was prepared in consultation with oil technicians of Imperial Oil Company, Ltd.'s Sarina, Ontario, refinery, and declared that 3000 barrels of Turner Valley crude could be used at the Sarina plant without major changes in refining equipment or processing. One cubic centimetre more of lead per wine gallon would be needed for gasoline produced from Turner Valley crude than that made from Mid-Continent crude now used. Increasing refining costs by 9-52/100 cents a barrel. The Turner Valley product produces as much gasoline as 1-26/100 barrels of Mid-Continent crude, but the amount of bunker fuel oil is less, the report said.

Brown estimated, after considering all factors, the value of one barrel of Alberta crude to be worth $2.0376 in Sarina compared to the laid-down cost of $1.957 for Mid-Continent crude at the Imperial Company's plant.

The Imperial Company is greatly interested in Turner Valley and is anxious to do anything possible to aid in developing the field, W. F. Prendergast, assistant to the president, told the board. He said he could not at this time, however, commit the company to taking 3000 barrels of Turner Valley crude a day at its Sarina refinery.

Speaking for British-American Oil Company, Ltd., another major buyer of Turner Valley crude for refining in the Prairie Provinces, F. B. Gaby, vice president, said his company would be glad to get Turner Valley crude for its Toronto refinery on a competitive price with East Texas crude now used. He said his computations showed Turner Valley crude to cost 8 cents a barrel more laid down in Toronto than East Texas crude when 4000 to 5000 barrels a day were used.

A brief favoring free entry to Canada of crude oil up to 47.6 gravity, the limit before 1936 when it was reduced to 42 degrees to halt import of "spiked" crude in an effort to evade the duty on gasoline, was presented by G. S. Hannah, assistant to the vice president in charge of operations for McColl-Frontenac Oil Company. He declared that new control methods made it impossible to import spiked crude, and importation of the lower-gravity crude was resulting in an unbalanced production of gasoline and heavy fuel oil. This situation, it was argued, was in conflict with the Canadian government's efforts in behalf of the coal industry in Nova Scotia. Hannah said his company was opposed to removal of the one-cent-a-gallon duty on gasoline.

Texas abandons plan to shut down two days

Definite abandonment of any plan to close down Texas oil wells two days a week was indicated by members of the Texas Railroad Commission at the statewide proration hearing held in Austin Friday. Commissioner Lon A. Smith joined with Colonel Ernest O. Thompson in a declaration that they were opposed to this program.

As the hearing began, Thompson called attention to the recent increase of one cent per gallon in retail gasoline prices at Dallas. He declared that this raise was inconsistent with costs since there has been no increase in the wholesale prices.

"The Railroad Commission," Thompson declared, "has the duty of looking after the consumer. We have balanced the supply of crude with the demand. We had considered closing down the fields two days of each week; however, if the consumers

W. F. (Fritz) Martin, president of F. W. Martin & Company, drilling contractors, well known to operators throughout the Southwest, is shown here as he "took off" from the Municipal Airport at Shreveport, Louisiana, for Tulsa. Martin is ex-president of the Ark-La-Tex Chapter of the Aeronautical Association, and is noted as a careful and capable pilot. His plane is a beauty, seating four; as his wife and two sons often accompany him on his aerial trips, it may be seen it is just the right size. Martin might be said to "commute" between Tulsa and Shreveport, as he has business that keeps him busy in both places.

are being penalized by such a plan, then these fields should be opened up."

Commissioner Lon A. Smith called attention to the fact that it was Thompson who had suggested the two-day shut-down.

"I said it might be needed," Thompson replied, "but I am opposed to it now."

"I am against it too," declared Lon Smith.

Request of the Humble Oil & Refining Company for an increase in the allowable for the Sugarland field which would permit it to produce without the one seventh cut resulting from the shut-down enforcement brought opposition from East Texas independents who urged that all fields in the state be required to cut production as East Texas is doing. The oil sought by Humble Oil & Refining Company is to fulfill a foreign contract, and Hines Baker, its attorney, told the commission that it could be produced from only eight Texas fields and that East Texas was not included in this group.

Ray Starnes, independent refiner from East Texas, urged that Humble Oil & Refining Company substitute East Texas crude for some of its Sugarland crude in its own plant.

"The price of East Texas crude is eight cents too high to meet competitive crudes, and the Humble company is too big and too rich to let us drown in oil," Starnes said. "Most of the East Texas refineries have been shut down now, and all will be killed finally.

"Louisiana and Arkansas crude can now be had for 91 cents a barrel. The East Texas market has been closed by the railroad commission, but the oil produced must compete in the open market." John Schroeder, representing the Danciger Company, joined in the protest and agreed with Starnes that the price of East Texas crude is out of proportion to the price paid for the other oils with which it must compete.

"Oil from the Van field which is produced from the Woodbine sells for $1.10 a barrel while East Texas crude sells for $1.35, and the transportation cost to tidewater is the same. This problem cannot be solved without considering this price differential between fields," Schroeder said.

"The price of East Texas crude," he said, "is not too high; the price of oil in other fields is too low."

As a possible solution to the problem, Commissioner Thompson suggested that the commission put every field on a marginal allowance to begin with. He pointed out that there would be then available 315,000 barrels of proratable oil to be divided among the fields on a potential basis.

Starnes, however, objected to this plan, pointing out that with its large potential, much of this allowance of proratable oil would go to the East Texas field where too much production is already on the surface.

The operators also opposed a daily well status report which would be required from every operator and they insisted that placing meters on pipe lines would be futile, because these could be so adjusted as to report increases.

"The effect of those reports and the meters would be the same as prohibition," Schroeder told the commission. "It would make criminals out of thousands of oil men who are operating with the law now."

Baker told the commission that East Texas crude could not be substituted for Sugarland crude in the Humble plant.

"Is it the idea of the commission that the refinery should close down?" Baker inquired.

"The little ones have closed down, why not the big ones?" asked Thompson.

"The little plants have not closed down because they lacked crude," Baker said.

"Crude oil has been one of the big commodities which has been stable and firm during the course of the depression," Thompson declared. "Why not rock along for 30 days more and see if conditions do not improve?"

Baker declared they had "rocked along" and that the company is still willing to continue a cooperative program. He pointed out that they had purchased from East Texas refineries some of the crude with which some of the plants were overstocked. Most of the operators indicated either by statement or by their silence that they favored the "rock along" plan and for this reason it appeared likely that the commission would continue the Sunday shut-down program with allowables about as they are now set.

The commission reported an increase of 7.08 pounds in bottom-hole pressure for the East Texas field from January 8 to February 8. This brought the average pressure to 1127.06 pounds on the latter date.

During the month the daily average allowable of 446,962 barrels indicated an increase in pressure of .51 pounds per million barrels of allowable oil.

The Bureau of Mines reported consum-

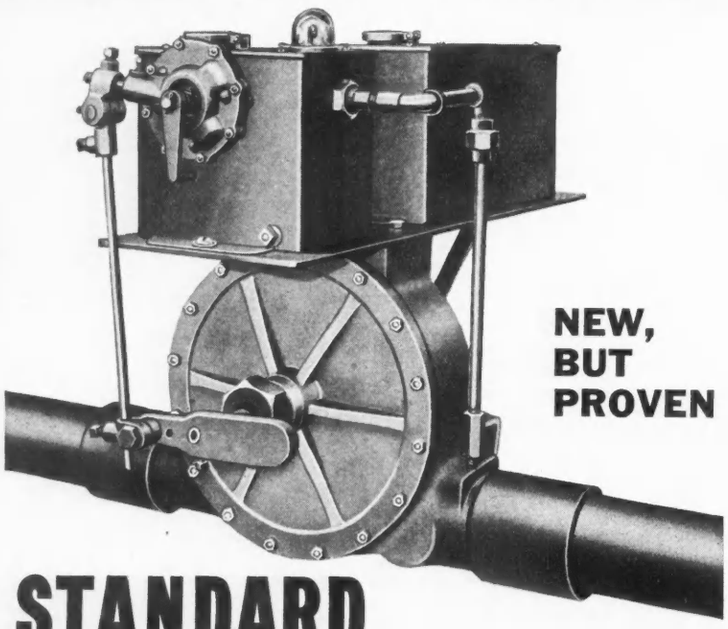
er demand for Texas oil of 1,344,900 barrels daily for March. This is 109,300 barrels in excess of the current field allowable.

The commission pointed out that there are 136 gasoline plants operating in Texas to which are connected 36,000 wells and that these plants are producing gasoline which is replacing 118,000 barrels of crude daily. This factor, the commission insisted, is becoming more important as additional plants are completed.

The commission postponed its scheduled hearing on gas/oil ratios in the Rodessa field and announced that hearing to consider revision of the casing program in that field would be taken up at the latter date.

Most of the operators who appeared at the hearing were content to ask that no cut be ordered for March. Strake Petroleum Company, however, announced that it had obtained a foreign contract for Conroe crude and the commission indicated that an allowable increase would be created to supply this additional demand. This brought a protest from many operators, especially in East Texas, who indicated that they believed that any increase should be distributed among all fields.

The commission, however, made it clear that it planned to continue the policy of granting increases to those fields whose operators were successful in obtaining markets for crude which would take oil formerly supplied by fields in other states or from wells in foreign countries.



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Automatic Chemical Feeder

Designed for properly injecting chemical for treating oil, the new STANDARD automatic Chemical Feeder embodies the many proven features of the STANDARD Lubricator so widely used today for the dependable lubrication of pumps, engines, compressors, and other oil country machinery.

The chemical is automatically pumped from a 7-quart chemical container by a regular STANDARD Lubricator, which is actuated through an impeller by the flow of oil in the line.

The unit delivers chemical into the oil stream according to adjustment by the operator . . . from 1 drop every 30 revolutions, to 1 gallon in 7 hours at 10 revolutions per minute. The sight feed shows the exact amount of chemical being delivered.

Added to the STANDARD Lubricator is an auxiliary pump attachment for lubricating all working parts in a bath of oil.

All parts are non-corrosive, including the ¼" pressed steel container and the ¼" pressed steel base.

AMERICAN LUBRICATOR COMPANY
DALLAS, TEXAS
EXPORT: OILWELL SUPPLY COMPANY

"STANDARD" LUBRICATORS

Kansas hearing to be held February 24

A hearing to determine the crude oil market demand for Kansas during March will be held at Wichita February 24, it was announced last week.

The February allowable for Kansas is 176,400 barrels, but purchases have been reduced to about 165,000 barrels daily, through action of companies buying in the state. The concerns are cutting their buying programs, due to market congestion.

Texas hearings scheduled

A special hearing to obtain evidence upon which to base an order prorating sour gas in the Texas Panuhandle has been scheduled for February 22 at Amarillo. The new order would apply to that portion of the Panhandle field producing sour gas in Gray, Carson, Hartley, Hutchinson and Moore counties.

Phillips Petroleum Company had asked for a special order, aleging that it was subjected to discrimination. The special hearing was called to consider such a measure and to obtain evidence which will not be involved with that evidence introduced at prior hearings where sweet gas proration was considered.

A hearing to consider special rules governing spacing, drilling and other operations in the Harper field, Ector County, has been scheduled for February 24 by the Texas Railroad Commission. The hearing will be held at Fort Worth.

A hearing to determine whether the Oilton and Killam fields in Webb County are separate has been scheduled for February 28 at Austin. At that hearing, the Railroad Commission will attempt to determine whether the fields are producing from separate reservoirs, and if this be the case, where the limit of those reservoirs lie.

The Texas Railroad Commission has postponed untl February 28th its hearing on the Hardin field in Liberty County. The hearing had been set for February 15.

Rules for spacing, drilling, completion and operation of wells in the East Bryson area, Jack County, will be considered by the Texas Railroad Commission at a hearing set for February 24, in Fort Worth.

The notice of hearing issued by the commission asserted that special emphasis would be given to the spacing program in the following surveys: W. M. Bryan, Thomas M. League, Mary Hamilton, and B. S. & F.

Texas statistical report shows growth in 1937

Reports completed by the Texas Railroad Commission last week show that Texas oil operators produced 507,234,236 barrels during 1937, a daily average production of 1,389,683 barrels. Meanwhile, the allowable for this period was higher, averaging 1,429,078 barrels daily for a total of 521,613,460 barrels.

During the course of the year, 441 new operators were added to the list of Texas producers, and a total of 5167 were producing in December. They held 15,122 leases, which was 1474 more than were producing in January, 1937.

At the end of the year there were a total of 77,565 producing wells, 9349 more than were producing in January. This included a total of 31,011 flowing wells and 46,554

Oil Production and Removal from Leases in Texas During 1937

ITEM	January	December	1937 Totals	Increase
Number of Operators (Totals)	4,726	5,167	.....	441
Number of Leases Producing	13,648	15,122	.....	1,474
Acres Reported	2,228,812	.....	.....	.....
Flowing Wells	27,699	31,011	.....	3,312
Pumping Wells	40,517	46,554	.....	6,037
Total Producing Wells	68,216	77,565	.....	9,349
Lease Storage (1st of Month)	4,201,317	4,581,615	.....	.....
Lease Storage (End of Month)	4,351,492	4,644,825	.....	.....
Difference in Storage	150,175*	63,210*	.....	.....
Total Months' Allowable	40,173,627	42,166,719	521,613,460	.....
Daily Average Allowable	1,295,923	1,360,217	1,429,078†	.....
Indicated Production for Month	39,062,768	41,001,016	507,234,236	.....
Daily Average Production	1,206,089	1,322,613	1,389,683*	.....
Runs to Pipe Lines	38,637.004	40,583,490	502,784,007	.....
Receipts by Pipe Lines	38,723,013	40,753,264	504,133,148	.....
Difference	86,009	169,774	1,359,383	.....
Tank Car Movements	32,776	39,580	473,496	.....
Truck Movements	91,282	136,520	1,531,324	.....
Fuel	28,748	23,221	382,760	.....
Miscellaneous Uses	24,828	31,303	363,842	.....

† Daily average allowable for year. * Daily average production for year.

pumping wells, an increase of 3312 and 6037 respectively.

October allowables were highest, averaging 1,479,562 barrels daily. The lowest allowance was in February when the average was 1,370,797 barrels per day. Thus allowables varied as much as 108,765 daily during the year.

The total runs to pipe lines for 1937 were 502,784,007 barrels. Pipe line receipts, however, totaled 504,133,148 barrels, an average of 1,381,186 barrels per day.

The difference of 1,359,383 barrels between pipe line runs and pipe line receipts results from the tank table deductions which were made early in the year.

The total movement of crude by tank car was 473,496 barrels, an average of 1,297 barrels per dav. Trucks carried 1,531,324 barrels, or 4200 barrels daily. The operators used 382,760 barrels for fuel, which was an average of 1048 barrels per day. Miscellaneous uses absorbed 363,342 barrels, an average of 996 barrels per day. Full details are carried in the appended table.

Panhandle-Eastern will enlarge gas line capacity

Panhandle Eastern Pipe Line Company is to expand its present system extending from fields in Texas and Oklahoma to eastern cities, and is purchasing right-of-way in southern Franklin County, Kansas, at present. A second 24-inch line will be constructed, to parallel the one now in use. It will be laid some time during the summer.

GUY E. (SQUIRE) GREEN, geologist for Wellington Oil Company of Delaware, San Antonio, was the principal speaker at the annual meeting of the South Texas Geological Society held in the San Antonio Petroleum Club February 18. He discussed the Seven Sisters field of Duval County, which had its major producing zone uncovered by his company.

Project advisory committees of Division of Production named

George A. Hill, Jr., vice president for production, American Petroleum Institute, has announced the appointment of members for the 1938 Project Advisory Committees of the Institute's Division of Production. They are:

Research Project No. 4—K. C. Heald (chairman), Gulf Oil Corporation, Pittsburgh; F. R. Clark, The Ohio Oil Company, Tulsa; W. B. Heroy, Consolidated Oil Corporation, New York; A. W. McCoy, Ponca City, Oklahoma; R. D. Reed, The Texas Company of California, Los Angeles; and F. H. Lahee, Sun Oil Company, Dallas, Texas.

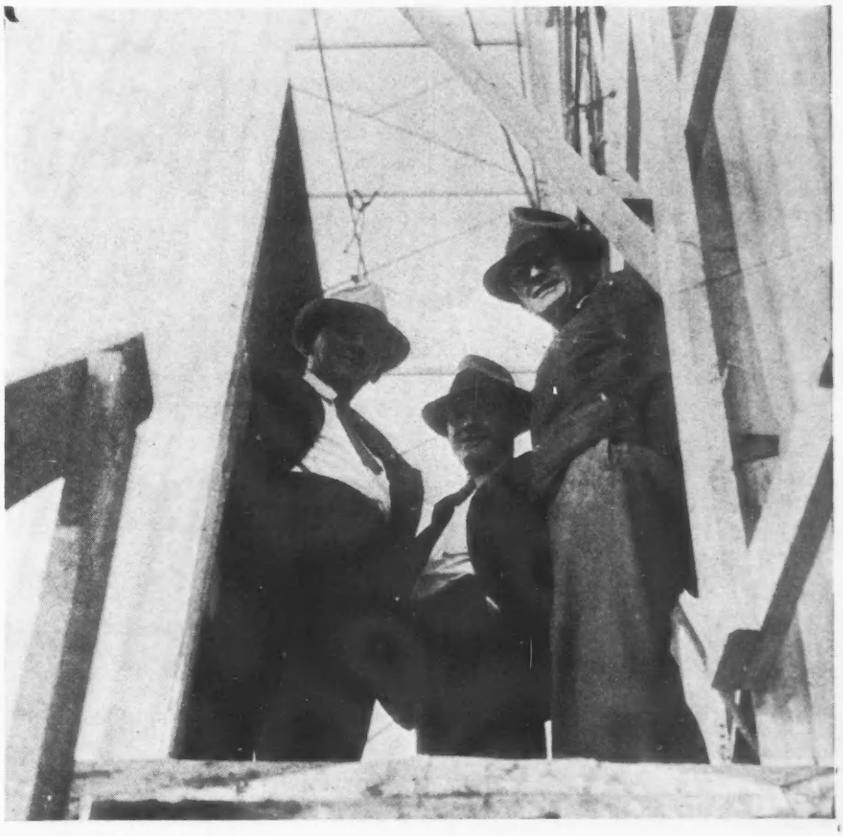
Research Project No. 27—E. G. Gaylord (chairman), Standard Oil Company of California, San Francisco; K. C. Heald, Gulf Oil Corporation, Pittsburgh; C. V. Millikan, Amerada Petroleum Corporation, Tulsa; T. V. Moore, Humble Oil & Refining Company, Houston; K. B. Nowels, Forest Development Corporation, Abilene, Texas; R. B. Roark, Shell Petroleum Corporation, Tulsa; A. C. Rubel, Union Oil Company of California, Los Angeles; W. C. Shutts, Standard Oil Development Company, New York, and F. E. Wood, Standard Oil Company (Indiana), Chicago.

Research Project No. 37—E. G. Gaylord (chairman), Standard Oil Company of California, San Francisco; C. V. Millikan, Amerada Petroleum Corporation, Tulsa; T. V. Moore, Humble Oil & Refining Company, Houston; K. B. Nowels, Forest Development Corporation, Abilene, Texas; A. C. Rubel, Union Oil Company of California, Los Angeles; W. C. Shutts, Standard Oil Development Company, New York, and F. E. Wood, Standard Oil Company (Indiana), Chicago.

Third World Petroleum Congress in 1940

A meeting of the Permanent Council of World Petroleum Congresses was held in Paris on January 22, 1938, under the presidency of Colonel L. Pineau, president of the council. Representatives of the following countries were present: Belgium, France, Germany, Great Britain, Holland, Roumania and the United States.

The Permanent Council unanimously accepted the invitation of the Deutsche Gessellschaft fur Mineralolforschung, presented by Professor L. Ubbelohde, to hold the Third World Petroleum Congress in Berlin during the months of May or June, 1940. In accepting this



Fred Winger, engineer for Standard Oil Company of Texas in the South Texas division, Mike Ledford, production superintendent for Salt Dome Oil Corporation, Houston, and Tom Flood, engineer for Standard Oil Company of Texas in the South Texas division, are shown from left to right at the interests' wildcat producing well in Galveston Bay, Chambers County, Texas.

invitation, the Permanent Council desires to record its appreciation of invitations which had also been received from organizations in the United States, Austria and Holland respectively, to hold the Third World Petroleum Congress in those countries.

The exact date of the Third World Petroleum Congress will be announced in due course. Due consideration will be given to the dates of other international congresses which are being arranged to take place in 1940 in Berlin, London, Rome and elsewhere, so as to avoid any overlapping with the date of the Third World Petroleum Congress.

Professor L. Ubbelohde as president of the Deutsche Gesselschaft fur Mineralolforschung will shortly proceed to the formation of the German Committee of Organization, which will assume responsibility for the arrangements of the Third World Petroleum Congress.

Ardmore. — Stockholders of Wirt Franklin Petroleum Corporation were advised last week that directors and officers will be elected at a recessed meeting to be held February 25. Announcement was made by Frank M. Porter, vice president and secretary. Amendment of the by-laws to provide for management of the corporation to be vested in the board of directors of not less than 5, nor more than 17, will be voted on.

General Power Units

DRILLING, PUMPING GENERATING

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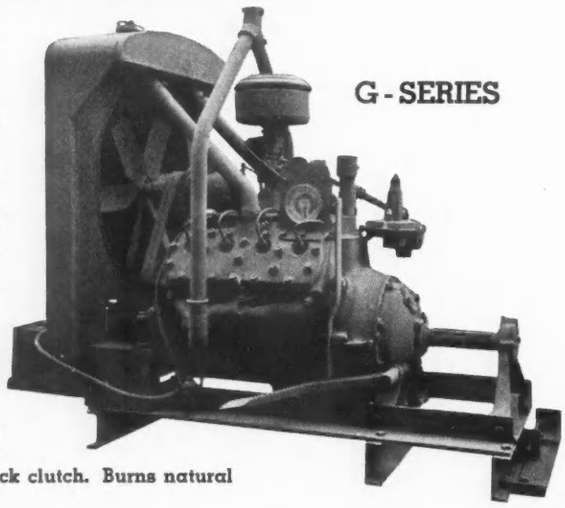

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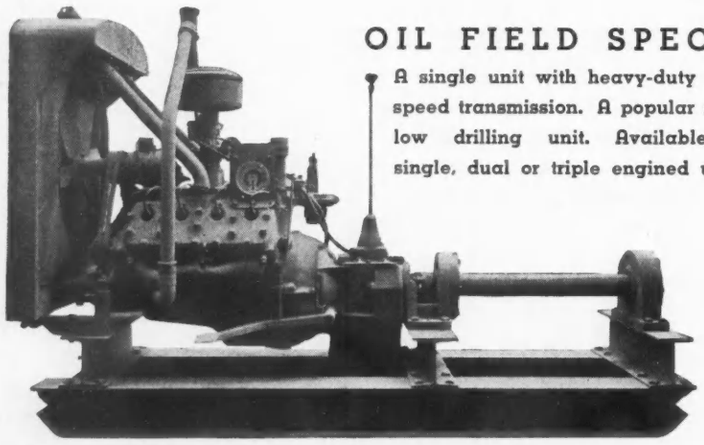

OIL FIELD SPECIAL

A single unit with heavy-duty four-speed transmission. A popular shallow drilling unit. Available in single, dual or triple engined units.

GENERAL POWER CO.

QUAPAW, OKLAHOMA

Pennsylvania 44-hour week held up by injunction

The Dauphin County court at Harrisburg February 16 suspended operation of Pennsylvania's new 44-hour week law when it granted an injunction sought by C. W. Miller, Perry County taxpayer. The ruling will be appealed to the state supreme court.

The law, which was described as one of the most drastic pieces of labor legislation to be enacted by any state and was protested by approximately 700 firms and organizations, became effective December 1. Enforcement was postponed by Ralph M. Bashore, secretary of labor and industry who was charged with administering the law, until January 3 to give employers more time to comply.

The law provides that the state industrial board may grant "modifications" of strict provisions of the law, and two such rulings issued were of some benefit to stripper well operators. One exempted employers of three or less persons, thereby giving relief to small operators who were permitted to maintain a 54-hour week, divided into six 9-hour days. The second ruling applied to "outside workers" and declared that "employers may permit employes in or immediately connected with outside work to average 44 hours per week over a period of one calendar month and to work 6 days per week where weather and climatic conditions have caused interruption of regular employment."

Both these modifications would be effective if the state supreme court overrules the Dauphin County court and finds the law constitutional.

Willis Daniels, counsel for Miller, contended in an argument before the lower court that an injunction should be granted to restrain Bashore from enforcing the act on all industry. He maintained that the department used a number of employes to administer the act, printed regulations and paid $15 to the industrial board for its sessions at which variations were worked out for industries that applied, declaring these things took money from the state's general fund and was a direct cost to the taxpayers.

Gasoline consumers to bear share of China burden

Oil circles in Japan see a liklihood of the gasoline consumption tax being increased by 1 sen per gallon in connection with the proposed taxation increase involving a 300,000,000-yen advance in tax revenue including the North China "incident" special tax. On the basis of the government plan for increase of the consumption taxes by 60,000,000 yen including those on sugar, wine and gasoline, the oil experts calculate that the elevation of the gasoline consumption tax by 1 sen per gallon or by a total of 4,000,000 yen on the basis of an estimated total consumption of 400,000,000 million gallons in 1938 will be inevitable.

D. MAXWELL MILLER, formerly in the Tulsa geological office of The Texas Company and during the past year in Kentucky, has been named district geologist for the company in Illinois. Succeeding W. C. Kneale, who has been named production superintendent for the company in Illinois and Indiana. Miller will make his office in Mattoon.

KANSAS FIELDS

Zenith and Geneseo pools have extensions in prospect.

* * *

Ellsworth County discovery doubles flow after acid.

Wichita. — The general slack-up in drilling activity for Kansas which started shortly after the first of the year, continued last week with only items of interest being reports that two pools may get half-mile extensions. A recent pool opener took another potential and more than doubled the initial production.

Possible extensioner for the Zenith pool of Stafford County is Stanolind Oil & Gas Company's McComb 1, SW NW SW 14-24s-11w. It had top of the Misener sand at 3792 feet and stopped to run casing and rig up standard tools before drilling further. It had a saturated core at that depth.

The other possible extension well is Cities Service Oil Company's Zajic 1, NW NE SE 11-18s-8w, a half-mile northwest of the Geneseo pool, Rice County. A core from 3208 to 3212 feet had a 2-foot recovery of siliceous lime, well saturated with oil. Casing was cemented at 3207 feet and operators were preparing to drill in.

Cities Service Oil Company et al's Schroeder 1, C NL NW 29-17s-9e, which opened a new area for Ellsworth County several weeks ago, was acidized with 3000 gallons and made a new potential of 2644 barrels of oil. The well was originally completed for 1321 barrels of oil from between 3205 and 3215 feet in the lime. Others interested in the well include Skelly Oil Company, Carter Oil Company, Continental Oil Company and Texon Oil & Development Company.

One half-mile east of production in the Drach pool of Stafford County, Atlantic Refining Company et al's Ritz 1, SEc NE 12-22s-13w, was shut down for orders after reporting several saturated cores from siliceous lime. Top of the formation was at 3705 feet. Cores were taken from 3704 to the total depth of 3713 feet.

Previously reported as a probable dry hole, Phillips Petroleum Company's John Kees 1, C SE SE 3-19s-30w, southwest of Dighton in Lane County, may be drilled ahead to siliceous lime. It was drilling at 4785 feet. The lime is expected at around 5000 feet.

Carter Oil Company was drilling below 3564 feet at Address 1, C NE SE 2-21s-13w, 4 miles north of the Gates pool in Stafford County. The well had only a small show of oil after drilling plug and cleaning out to the total depth of 3554 feet in siliceous lime. There was no show at the last reported depth.

Two miles south of the Stumps-K.C. area of Rice County, C. L. Price et al's Gemeinhardt 1, NEc SE 18-18s-10w, made 7 barrels of oil in 1 hour during a 15-hour test of the siliceous lime at 3297 feet. The production followed acidization, first with 300 gallons and later with 600 gallons. It was showing a little water.

A new test in the Lindsborg pool of McPherson County, northwest of the town of Lindsborg, is Carter Oil Company's Nelson 1, C W½ NE SE 7-17s-3w.

W. E. Witt et al's Rieff 1, NWc NE 22-8n-10w, drilled to a total depth of 3277 feet in siliceous lime and pumped 162 barrels of oil and no water in 22 hours. Production followed acidization with 1000 gallons. Operators believe gas is sufficient to make the well flow and were installing a gas anchor. The well is a half-mile north of the Orth pool of Rice County.

Burrton, Kansas, gas production allowable set

Net gas allowable for the Burrton field of Reno and Harvey Counties has been set at 923,367,000 cubic feet for February, according to a report issued last week by the conservation division, Kansas Corporation Commission.

Based on the estimated market demand of 923,393,000 cubic feet for the month, the gas is to be produced from each well capable of producing gas at a pressure sufficient for it to enter the existing dry gas pipe lines in the field.

Combination wells, those producing both oil and gas, have been restricted to 5000 cubic feet per barrel of oil produced. This is necessary, the order states, because the gas, not taken through the regular dry gas lines, is in most cases, taken by gasoline plant pipe lines.

Two-fifths of the allowable is allocated to acreage, 2/5 to open flow and 1/5 to well pressure. Gas is computed at 14.65 pounds pressure base.

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OKLAHOMA FIELDS

Garfield County discovery may mean pool of importance.

* * *

Development in deeper South Oklahoma areas is up.

Tulsa.—Despite state-wide rains, accompanied by snow, sleet and freezing temperature, Oklahoma had a busy and profitable week, opening a new pool southeast of Waukomis in Garfield County, and laying plans for expansion of the new Ramsey pool of Payne County. In the Cement pool of Caddo County, the state's largest gas producer in several years was brought in. Deepest well in the state, south of Bradley in Grady County was rotating at 10,560 feet. And in the Fox pool, several new tests were getting a good start.

Harry Hollenback et al's Clark 1, NWc 34-21n-6w, 5 miles southeast of Waukomis in Garfield County, last week opened the fourth new pool for Oklahoma since the first of the year, and the second area thought to have possi-

bilities as a major pool. Estimated good for 300 to 500 barrels daily, the well was making 55 gravity oil from the Marshall zone, a sandy dolomite between first and second Wilcox sands.

The test drilled to 7336 feet in Second Wilcox sand, but found salt water and some oily mud, so was plugged back to the Marshall zone, had from 7145 to 7319 feet. Casing was perforated, following which the hole filled 3000 feet with oil. After making a 3-minute flow of light green, high-gravity oil, the well was shut in for 10½ hours. When opened later, it cleaned itself in about 8 minutes, flowing 15 feet up into the rig, with gas estimated at 3,000,000 to 5,000,000 cubic feet. It was shut in to erect tankage. Tubing will be run and the well acidized through the perforations.

Clark 1 had a thin section of Mississippi lime at 7025 feet, and topped First Wilcox sand at 7190 feet. The formation ran to 7245 feet, where the Marshall was encountered, and Second Wilcox sand was found at 7319 to 7336 feet. Possibilities that the lower sand will be tested are said to be slight.

Numerous major companies are reported to have extensive holdings to the north, west and south of the new strike. Companies supporting Hollenback included Indian Territory Illuminating Oil Company, Magnolia Petroleum Company, Phillips Petroleum Company and Turman Oil Company.

Located 11 miles southwest of the Garber pool, the new producer is looked on by geologists as the key to extensive development in the general area, especially to the northwest and west.

Meanwhile, to the southeast in Oklahoma County, W. O. Allen et al's Jackson 1, C E½ SE NW 6-14n-3w, was receiving considerable attention after reports stated it was checking higher on the Hunton lime than several dry holes in the immediate vicinity. It had top of the formation at 6211 feet and was drilling below 6255 feet.

In the Lamont pool, Grant County, Carter Oil Company et al's Barclay 1, C EL SE NE 17-25n-3w, was drilling below 5548 feet in hard white sand. Latest test to be started there, Carter Oil Company's Crisman 2, C E½ NW NW 16-25n-3w, was building rig.

Tulsa Sector

Another location was announced for the Ramsey pool, Payne County, last week as two offsets to the discovery well cemented casing and a third was nearing the sand. New test is E. H. Moore's Boyd 1, NEc 24-18n-1e, a half mile south of the south offset to Ramsey 1. The company may also make location soon for Means 1, NWc 19-18n-1e, 6 miles west of the discovery well and 1 mile southwest of Marylund Oil Company et al's Moore 1, SE SW NW 17-18n-1e, which was moving in tools.

South offset to Ramsey 1, Mid-Continent Petroleum Corporation et al's Columbia 1, NWc SW 18-18n-2e, had Viola lime at 4700 feet, said to be about 10 feet higher than Ramsey 1. It was waiting on cement after running pipe. Southwest diagonal offset, Wetzel 1, NEc SE 13-18n-1e, was drilling below 4445 feet, rapidly nearing the pay formation. When last reported, it was checking level with the discovery well.

The southern part of the state also came through with an interesting item as the largest gasser for Oklahoma in several years was brought in by Magnolia Petroleum Company at Niles 10, SWc NW 36-6n-10w, in the Cement pool of Caddo County. The well drilled in the Hedlund horizon at 4360 feet and after going to 4450 feet, made 203,500,000 cubic feet of gas.

Operators were preparing to take potential at Ray Stephens et al's Funk 2, SE SW SE 1-5n-9w, which drilled to 5355 feet for an initial production of 750 barrels of oil. Tubing and rods were being run for the test. Production at the well has fallen off to about 250 barrels daily.

In the Marlow area of Stephens County, Coline Oil Company's Johnson 1, SW SE NE 1-2n-8w, swabbed approximately 15 barrels of oil from between 8900 and 9000 feet. It was preparing to resume bailing.

Gulf Oil Corporation overcame trouble with a caving hole at Thomas 1, SW NW NW 14-4n-5w, south of Bradley in Grady County, and was rotating at 10,560 feet. Under normal conditions the well has been making 25 to 40 feet of hole a day, but recent state-wide rains have caused frequent shut-downs.

In the oolitic lime sector of the Fox pool, Carter County, Gulf Oil Corporation was preparing to run tubing at Smith Estate 1, C SW SW 26-2s-3w. The well had been killed and drilled from 7773 feet to 7920 feet in an effort to eliminate the freezing temperature of the production. It is bottomed in shale, topped at 7902 feet.

Other tests, recently started in the field, were getting under way. Wirt Franklin Petroleum Corporation et al's Williams 1, CW SE 27-2s-2w, was moving in tools. Gulf Oil Corporation's Garrett 8, C NW SW 27-2s-3w, was spudding, and McClure 2, C SE NE 28-2s-3w, was running surface pipe to 1002 feet. Gulf Oil Corporation and Carter Oil Company's Lester 1, C NW NW 35-2s-3w, was driling below 2029 feet in shale. Inclement weather forced Carter Oil Company to shut down at Geagin 1, C NW SW 36-2s-3w, after erecting derrick. It is the most southeastern test in the field.

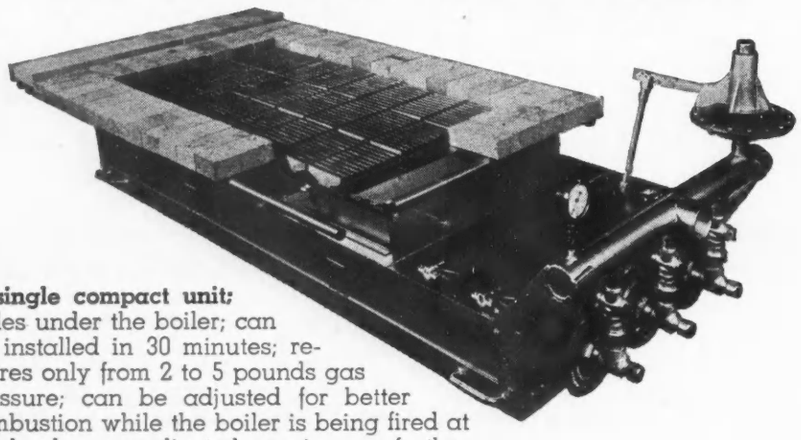
Hill County deep test

A block of leases, approximately 9000 acres, has been secured by Bell-Oils, Inc., and Sam Dorfman, in the southeastern part of Hill County, Texas, near the town of Hubbard, for a deep test, contract calling for a depth of 5000 feet. The derrick has been erected, with machinery and tools arriving ready to be rigged up, and will spud in during the present week. This test is located on the W. J. Freeland 90-acre tract, in the Lawrence Copeland Survey, Hill County, Texas.

Bell-Oils, Inc., Claude Bell, president, with office located at 1913-14 Republic Bank Building, Dallas, Texas, and Sam Dorfman, Longview, Texas, have undertaken this work and will carry the test down to contract depth, unless production is found before reaching that point. For the past 25 years, Bell has been identified with the producing phase of the oil industry, while Dorfman is known as a dealer in drilling machinery, casing and general oil field equipment.

The New SONNER

Oil Field GAS SAVING BURNER



A single compact unit: slides under the boiler; can be installed in 30 minutes; requires only from 2 to 5 pounds gas pressure; can be adjusted for better combustion while the boiler is being fired at full load; once adjusted requires no further attention; will develop the highest possible overloads with absolutely no damage to the boiler because the heat is applied to the crown sheet and flues instead of the sidewalls and mudring, thereby eliminating a lot of boiler trouble, as well as giving higher efficiency.

SEE COMPOSITE CATALOG PAGE 1914

Export Distributors: THE OIL WELL SUPPLY COMPANY

The SONNER BURNER COMPANY Winfield Kansas

NORTH TEXAS FIELDS

K-M-A extension test delayed by bad weather conditions.

* * *

Wilbarger County wildcat has showing in Strawn sand.

Wichita Falls, Texas.—Testing of a group of K-M-A deep outposts that have reached the Strawn horizon was halted along with most of the drilling activity in the field proper due to excessive rainfall and flood waters. Another major northwest extension in the Electra arch sector is rated as the most promising of the outposts.

South portion of the South Electra field is likely to share in the Strawn production. Prospects were enhanced when F. W. Merrick, Inc., and Target Drilling Company's W. T. Waggoner 1, SW SW NE H&TC Section 35, Block 5, 4-1/3 miles northwest of Joe Worsham et al's flowing producer on the Waggoner Brothers ranch, cored oil saturation in sandy-lime at 3595-3615 feet and 3635-50 feet. Operations were halted to run pipe. Top of lime marker was logged at 3603 feet, with an estimated elevation of 1120 feet. It is believed to be on the west edge of the buried plateau that embraces the South Electra field.

Rathke Oil Company et al's T. L. Burnett-Gulf 1-A, 3¼ miles northwest of production and 2¾ miles northeast of Merrick et al's prospective producer, is showing for a 50-barrel pumper while cleaning out from nitro shot. It was plugged back from water in Ellenberger lime at 3738-39 feet to 3692 feet, or 2555 feet sub-sea. Top of lime was called at 3420 feet. It is only slightly more productive than an offset failure drilled in 1929 to 4295 feet, but definitely gives the Electra arch its first production in the Strawn, which is materially thinner than within the K-M-A field. Clark & Cowden Drilling Corporation and Southwood Oil Company's W. T. Waggoner 1, situated on south 200 acres of A. Gibson Survey, A-455, also a northwest outpost, was drilling at 2030 feet, with an elevation of 1116 feet.

Running Low

Low structural position recorded by King Oil Company, Perkins and Cullum's T. L. Burnett 1, NWc S½ SE Section 2, W. W. Carroll Survey, A-434, 1-2/3 miles northwest of production in the northeast portion of K-M-A, in drilling to 4040 feet, or 2978 feet sub-sea, forecasts a failure. Reports indicate that pipe will be set and machine moved in to drill plugs. Heyser, Heard & Clardy, Inc.'s Fassett-Tuttle 1, SWc of SA&MG Section 3, A-267, situated on north bank of the river and on a line between northeast and east outpost producers, logged top of lime at 3814 feet, with an elevation of 988 feet, and cored saturated sandy-lime 3991-4006 feet. Laboratory analysis of sand core at 4006-08 feet indicated salt water. Pipe has been cemented for a test.

Southeastern Wilbarger County has entered a bid for a share of the deep production since a wildcat logged oil saturation in sand member of the Strawn at 4087-95 feet. This development took place last week on Lloyd H. Brown et al's W. T. Waggoner 1, SE NW SE H&TC Section 33, Block 6, being 6¼ miles west of K-M-A deep production. Pipe has been cemented for a production test. Top of lime was called at 3999 feet, or 2860 feet sub-sea, indicating a lower structural position than an intermediate failure on the Ancell tract. Completion of a commercial producer by Brown et al would establish a new area instead of affording a major extension for the K-M-A field.

K-M-A entered the past week with 130 completed wells, prorated to 58 barrels daily with production cut off on Sundays. The field has 175 operations on the current activity report, including 55 tests in process of completion else they have 7-inch pipe cemented. Rotary rigs were active on 54 tests between casing points. Surface pipe has been landed on 16 additional tests. Two projects were listed as inactive. Derricks were up on 19 sites, and 29 locations were listed on the report. Peak level in drilling has not been reached. When favored with good weather, operators and contractors are establishing new records for drilling. Reports credit a few tests with drilling from the surface pipe to top of pay within 10 days.

Prolific Kadane sand section of the Strawn was extended half mile and to the north bank of the river when Mulberry Oil Company's R. J. Bradley 1, SWc of 160-acre lease, M. L. Gahagan Survey, A-456, flowed 133 barrels oil in one hour at 3753 feet. Pipe was cemented on top of first saturation at 3665 feet, and the test was drilled in with rotary. Top of lime was called at 3622 feet.

Acid has been used on a second test by The Texas Company primarily as an experiment before proceeding to the main pay zone. This company's First National Company 24, SWc lot 8, Block 26, used 2000 gallons of chemical solution at 3611-80 feet with negligible results. The well flowed by heads when deepened to 3705 feet, with an elevation of 1009 feet. First National Company 23 also used acid in the upper lime, and is flowing by heads with the hole bottomed at 3835 feet.

NORTH TEXAS Completions

Company. Well and Location	Init. Prod Bbls.	Depth
ARCHER COUNTY (K-M-A)—		
Nazro et al, Ferguson 1, lot 3	944	3867
ARCHER COUNTY—		
Brown et al, Wallace 1, blk 11	15	1785
Fraser et al, Kinder 1-A, sec 68	*	1401
H. H. Fraser & Proctor, Coleman 2-A, sec 81	*	1403
Rathke Oil Co., Scott 4	*	1254
CLAY COUNTY—		
Seitz-Comegys & Seitz, Wright 1, sec 2632	*	4112
COOKE COUNTY—		
Kingery Bros., Johnson 3	110	1215
Geo. L. Pace Pet. Co., Winstead 4-B	120	1215
FOARD COUNTY—		
Texas Co., Johnson 15, sec 36	360	3572
JACK COUNTY—		
Josaline Prod. Co., Beasley 3	25	2965
WICHITA COUNTY (K-M-A)—		
Blackwell O&G Co., W. L. Hodges 3-A	1656	3861
Perry Browning et al, Lewis 1, blk 20	648	3754
Burns, Tr., First Nat'l Co. 1, blk 26	259	3859
Consolidated Oil Co.-Joe Howell, Ferguson 3	641	3760
Deep Oil Dev. Co., First Nat'l Co. 7, blk 27	824	3837
E. C. Oil Co., Hodges 1 (31.3-ac)	615	3819
Kadane-Griffith Oil Co., Mangold 3, blk 38	1984	3777
Reed-Glass & Crenshaw, First Nat'l Co., 5-A, blk 27	248	3815
J. I. Staley Oil Co., Ferguson, blk 2	594	3845
McFall 1 (243.8-ac)	35	4000
WICHITA COUNTY—		
Dinsmore & Stipe, Burnett 11, sec 1	*	528
Mason et al, Martin Bros. 1, blk 10	*	1235
Perkins-Cullum, S. B. Burnett 12-A sec 2	40	1550
WILBARGER COUNTY—		
Baker et al, Waggoner 2-H	*	1143
Webb et al, Waggoner 2-D, sec 42	135	2377
YOUNG COUNTY—		
Cable Oil Co., Snider 40	10	620
Green et al, Edwards 1, sec 148	*	975
Steele et al, Davis 1, blk 13	86	3680

*Failures; †Junked; ¶Million cu. ft. gas.

Midland, Texas.—Barnsdall Oil Company began operating its well-pressure absorption type of natural gasoline plant in the Foster field, Ector County, on February 7. It is rated at 6,000,000 feet daily, and is located on the company's H. C. Foster F lease, S½ T&P Section 18, Block 42, T-2-S. Production will be marketed by tank cars from a nearby rack on the Texas Pacific Railroad.

Midland, Texas.—Phillips Petroleum Company is erecting a polymerization unit near its natural gasoline plant in the Judkins-Pennwell field, Ector County, to step up the octane rating of the gasoline produced by this plant and also the output of plant in the Goldsmith field, Ector County. The latter plant is owned jointly with Landreth Production Corporation, and is rated at 50,000,000 feet daily.

Salt water drowns Sherman County oil prospect

Amarillo, Texas.—Appearance of salt water at normal level in the big lime section eliminated oil prospects for a wildcat gasser in southwestern Sherman County. Indian Territory Illuminating Oil Company's Davis 1, C NE T&NO Section 404, Block 1-T, has caused unusual interest to be focused upon the above county after developing sweet gas production, rated at 31,000,000 feet from broken lime at 2705-3116 feet. Un-

til water was encountered at 3560 feet, or 39 feet above sea level, the test was considered a good bet for oil production. Drilling has been resumed to determine the volume of water, then the hole will be plugged back to give the county its first producer. Top of lime marker was logged at 2380 feet.

Drilling is to be resumed on Western Union Oil Company's F. C. Farwell 1, C NW 18-3n-2e, Deaf Smith County wildcat, after clearing up fishing job at 5625 feet. It is contracted to drill to 6000 feet.

TEXAS PANHANDLE
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CARSON COUNTY—		
Magnolia, Fee 35, lse 244	117	3000
Pansota Oil Co., B. F. Block 2	615	3150
GRAY COUNTY—		
Cities Service, Meers 4-C	358	3269
Dye et al, Saunders 6	581	2993
Gulf, Faulkner 11-A	105	2965
Saulsbury Oil Co., Yoder 1	*	3353
HUTCHINSON COUNTY—		
J. E. Crosbie, Pitts 25	468	2960
Phillips, Johnson-Juanita 4	652	3080
Sinclair Prairie, Merchant-Vacuum 5	¶30.6	2724
Stayton Oil Co., Moore 6-C	412	3188
Texas Co., Moore 7	25	3107
Pond 11	608	3077
Tide Water Associated & Darby Pet. Co., Thompson 1	304	3211
Watchorn et al, Whittenburg 1, sec 15	303	2705
L. L. Wiles Oil Co., Perkins 1	676	3083
MOORE COUNTY—		
Sinclair Prairie, Jones 1	¶45¼	3413
WHEELER COUNTY—		
DuMar O&G Co., George 2	¶24.7	1822
Lela O&G Co., Laycock 11	¶5	2276

*Failures; †Junked; ¶Million cu. ft. gas.

WEST TEXAS FIELDS

Slaughter pool revealed as one of largest in Permian area.

* * *

Three tests seek extension of Bohago one-well field.

Midland, Texas.—Major extension afforded by the fourth flowing completion for the Slaughter pool, southwestern Hockley County, reveals that the area will be one of the largest in the north portion of the Permian basin with comparatively little variation in the structural position of the lime. Richardson Oils, Inc.'s Slaughter 1, SWc Labor 59, League 39, Maverick County School Lands, advanced production 2 miles to the north of the discovery with an initial flow of 239 barrels of oil in 10 hours after 380-quart nitro shot at 4895-4989 feet. Hole is bottomed at 4994 feet, or 1447 feet subsea. It is about 100 feet higher on structure than the discovery, and is the highest of the quartet of wells.

Discovery of the Slaughter pool last April by The Texas Company broadened the Permian basin production to the northeast. Due to its isolation from pipe line and rail facilities, oil production is marketed by tank trucks. Four additional projects are under way, including two outposts by Gulf Oil Corporation. The latter's M. G. Gordon 1, NWc PSL Section 12, Block X, southeast outpost, was drilling at 4421 feet, and Mallett 1, NEc PSL Section 6, Block X, southwest of the discovery, had progressed to 4610 feet, checking slightly higher than the discovery.

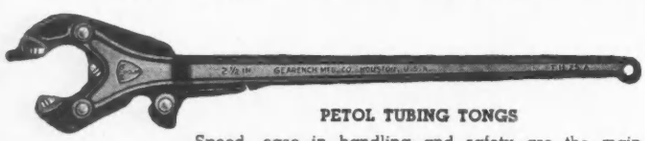
The Texas Company is moving in rig to drill Mallett Land & Cattle Company 1, NEc PSL Section 7, Block G, southeastern Cochran County wildcat. It is southwest of the Slaughter pool and southeast of the Duggan area, Cochran County.

Southeast extension for the Bohago one-well pool, Yoakum County, may be attained by one or more of the trio of closely situated outposts now under way. Bohago Oil Corporation and Bond Oil Corporation's J. L. West 1, SEc Section 607, is credited with having cored 16 feet of oil saturated lime at 5286-5302 feet, with an elevation of 3664 feet Seven-inch pipe was cemented at 5230 feet. Cable tools will be installed to drill plugs and test. This test is about 80 feet lower on structure than the discovery, which is not rated as a commercial producer. Ohio Oil Company's Claywater 1, C NW NW Section 638, registered oil saturation in cores at 5220-64 feet, with an elevation of 3659 feet. Preliminary swabbing test after using 2000 gallons of acid yielded slightly more than 1 barrel of fluid per hour, including a small amount of free oil and balance drilling fluid. It will be acidized again, and probably shot. Gulf Oil Corporation's Dixon 1, SW SE SE Section 609, was drilling hard lime at 5194 feet with thin zone of saturation at 5169 feet. The elevation is 3638 feet.

North portion of the Wasson field, Yoakum County, added two flowing wells. Sun Oil Company's Lynn 1, C NE NE Section 798, flowed 273 barrels initial after using 6000 gallons of acid at 5065 feet, or 1456 feet sub-sea. The Texas Company's Willard 2, an east offset, swabbed 10 barrels hourly after using 7000 gallons of acid at 5085 feet, or 1472 feet sub-sea. The latter's Willard 1, flowed 618 barrels initial after 7000 gallons of acid in lime at 4914-5085 feet, with an elevation of 3614 feet. Shell Petroleum Corporation's Baumgart 1-C, near C W½ NE Section 866, east out-

PETOL TOOLS TITAN TOOLS

STANDARDS
THE WORLD OVER!



PETOL TUBING TONGS

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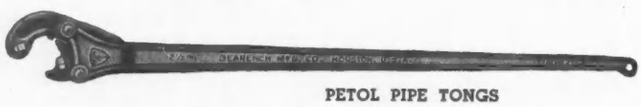
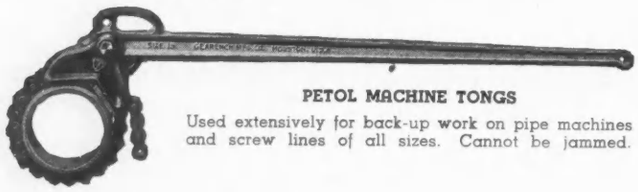


PETOL PIPE TONGS

Widely used for making up and breaking out screw pipe on lines.



PETOL MACHINE TONGS

Used extensively for back-up work on pipe machines and screw lines of all sizes. Cannot be jammed.

GEARENCH MFG. COMPANY
HOUSTON, TEXAS, U. S. A.
"Most Complete Line of Tongs in the World"

post, cored saturation at 4988-5018 feet, with an elevation of 3580 feet, then cemented pipe at 4617 feet. Continental Oil Company and Amon G. Carter's Wasson 5, south offset to the discovery well of the Wasson field in Gaines County, gauged 1431 barrels oil and 1,760,000 feet of gas initial after using 6000 gallons of acid at 4970 feet.

The Bennett field, Yoakum County's original strike, added another large producer when Texas Pacific Coal & Oil Company's Bennett 4, near C W½ NW Section 678, flowed 1399 barrels oil and 1,250,000 feet gas initial through 2-inch tubing after 720-quart nitro shot as 5080-5275 feet. This area is rated as the most consistent and probably the best in the north basin, but development has been restricted to about 600 acres.

Initial flow of completions in the

WEST TEXAS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ANDREWS COUNTY (Means)—		
Humble, Means 36	388	4522
Means 17	458	4534
CRANE COUNTY (McCamey) —		
Choate-Hogan & Reese, Carter 1	*	2195
CROCKETT COUNTY (Hoover)—		
Ringle et al, Hoover 2	*	2122
ECTOR COUNTY (Foster)—		
Stanolind, Cowden 8-B	1111	4165
ECTOR COUNTY (Goldsmith)—		
Dunning Est., Slator 4	25	4291
Gulf, Goldsmith 69	2752	4255
Humble, Scharbauer 8-C	1042	4210
Shell, Cummins 3-A	1320	4250
ECTOR COUNTY (Harper)—		
Broderick & Calvert, Parker 2	2998	4220
Parker 3	1964	4220
ECTOR COUNTY (Jordan)—		
Fogelson et al, University 5-A	520	3645
ECTOR COUNTY (Wildcat)—		
Bodkins et al, Edwards 1	*	4901
FISHER COUNTY (Royston)—		
Gen'l Crude Oil Co., Young 6	11	3147
FISHER COUNTY (Rotan)—		
Magnolia, Smith 1	*	3572
GAINES COUNTY (Wasson)—		
Continental, Wasson 2-B-53	495	4971
Conoco-Carter, Langdon 2-44	863	4984
Wasson 5	1431	4970
HOWARD COUNTY—		
Merrick & Bristow, Hooks 14	1240	3227
Magnolia, O'Daniel 3	626	2800
Noble Drl. Co., Chalk 4	1056	3025
Sinclair Prairie, Dodge 52	350	2825
Sun, Snyder 2	611	2835
PECOS COUNTY (Netterville) —		
Marsh, Jr., et al, Netterville 2	210	2295
PECOS COUNTY (Pecos Valley)—		
Big Bend P. L. Co., Iowa Realty 1	263	1645
E. M. Thomason Prod. Co., P. V. Oil Co. 3	¶1½ & 3	1652
PECOS COUNTY (Taylor-Link)—		
Shell, University-Bower 2-G	146	1688
PECOS COUNTY (Wildcat)—		
Baker et al, White-Baker 1	*	1939
UPTON COUNTY (McCamey) —		
Bennett Pet. Corp., (was Ajax Drlg. Corp.), Shirk-Texon 4	502	2477
Mangus Oil Corp., Owens 1	*	2840
Nolan et al, Long 1	24	2126
Rutter Corp., Egolf 1	*	3295
Shell, Baker 1	792	2230
WARD COUNTY—		
Cities Service, Brandenburg 2	40	2092
Humble, Richter 27	626	2923
Richter 29	596	2602
University 21-F	467	2750
Magnolia, Sealy 1-46	125	3040
Schkade & Patillo, Dorr 1	*	2015
States Oil Corp., Spencer 1	†	660
WINKLER COUNTY (Emperor)—		
Stanolind, Cowden 3	365	3033
WINKLER COUNTY (Kermit)—		
Amerada, Daugherty 7-A	721	2964
Gulf, Clapp 27	61	3090
Magnolia, Walton 128	179	2917
Walton 132	1457	2970
Walton 133	1656	2926
Sun, Daugherty 8	443	2970
YOAKUM COUNTY (Wasson)—		
Shell, Baumgart 1-B	487	5010
J. H. Lynn 1	273	5065
Texas Co., Willard 1	618	5085

*Failures; †Junked; ¶Million cu. ft. gas.

FAST CONVENIENT

Air-Conditioned Service Between

HOUSTON and TULSA

	Going		*Returning*	
	"Hustler"	Streamliner "Sunbeam"		
Lv. HOUSTON	9:00 A.M.	4:00 P.M.	Lv. TULSA	2:45 P.M. 10:15 P.M.
Ar. DALLAS	3:00 P.M.	8:45 P.M.	Ar. DALLAS	10:10 P.M. 7:15 A.M.
			"Owl"	"Hustler"
Lv. DALLAS	4:00 P.M.	11:00 P.M.	Lv. DALLAS	11:45 P.M. 9:45 A.M.
Ar. TULSA	11:30 P.M.	7:55 A.M.	Ar. HOUSTON	7:10 A.M. 3:45 P.M.

Cafe-Lounge Car and Coaches on "Hustler." Parlor Car, Diner-Lounge-Observation and Chair Cars on Streamliner "Sunbeam." Sleepers, Observation-Lounge-Sleeper, Chair Cars and Coaches on "Owl."

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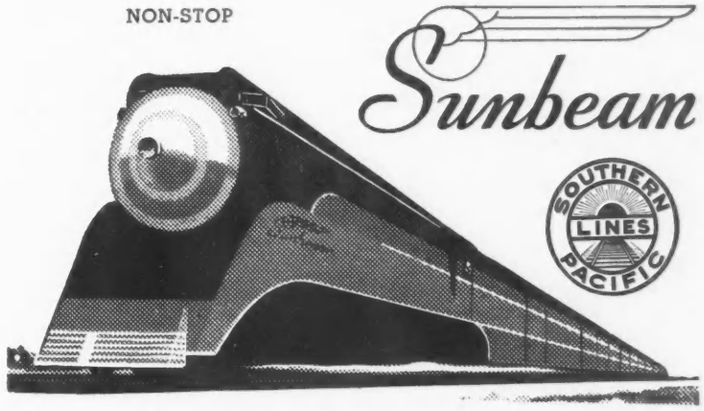

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Harper field, Ector County, reach a new mark when Broderick & Calvert's J. E. Parker 2, NE SE SE T&P Section 22, Block 44, gauged 2998 barrels after 480-quart nitro shot at 4220 feet. Parker 3, SW SE SE Section 22, flowed 1964 barrels initial following 344-quart shot at 4220 feet.

York & Harper, Inc., assigned its lease on N½ SE T&P Section 27, Block 44, T-2-S, southwest flank of the Harper field, to Lee Drilling Company. Former is to be carried for fourth overriding royalty until lease is developed and costs amortized from production, then the property will be operated on a 50-50 basis. Bonus of $100 per acre, half cash, was paid by Stanolind Oil & Gas Company for lease on 1213 acres, embracing parts of Section 1, Block 44, and Sections 5 and 6, Block 43, T-2-S, about 3 miles northeast of production in the Harper area. This acreage is on a southeast trend from the Goldsmith field, and is fortified with subsurface geology due to dry holes to the northeast and one to the southwest.

Intermediate water found in broken lime pay by Magnolia Petroleum Company's Geo. Sealy 1-46, NE SW NE Section 46, Block F, northern Ward County semi-wildcat, was successfully cased off and the well flowed 125 barrels natural through tubing from lower pay at 3035-40 feet. Small oil well was indicated at 2790-2800 feet, but water appeared at 2890-2934 feet. Shutoff occurred when 7-inch was cemented at 2998 feet. Location is ¼ mile east by north of discovery. Rig has been skidded one location east to drill Sealy 2-46. Comparatively few West Texas areas produce oil immediately below water zones. Such a condition prevails in the Eaves pool, Winkler County, and Settles field, Howard-Glasscock district.

Operations were suspended on two Ordovician projects. Ordovician Oil Company's Evans 1, Sutton County, abandoned in sulphur water at 4185-88 feet. Top of Elenberger was called at 4085 feet, with an elevation of 2126 feet. Tex-tor Oil Corporation's Judkins-Spencer 1, Schleicher County, fulfilled depth contract at 6207 feet and shut down. Top of Ellenberger was logged at 5547 feet, or 3312 feet sub-sea. No water was found in this horizon.

Seven-inch pipe is to be set at 5330 feet by Magnolia Petroleum Company and Tex-Mex Petroleum Corporation's McKee 1-A, northern Pecos County deep prospect. Minor oil and gas showings in the Simpson, topped at 4775 feet, will be re-tested if deeper drilling fails to yield a commercial producer.

Allowable is increased in South Texas field

The Texas Railroad Commission last week issued an order effective February 10 increasing the allowable of the Plymouth field from 12,449 barrels to 15,464 barrels per day. The effect of this order is to increase the maximum per well alowable from 70 to 110 barrels per day.

When the order was released, Railroad Commissioner Ernest O. Thompson announced that similar increases would be granted to other fields which were successful in obtaining contracts for sale of oil to foreign markets, such as had been done by operators in the Plymouth field.

Fires extinguished at Hidalgo County wells

Mission.—After fighting the fire for several weeks, blazing Swallow 1 and 1-A of D. D. Davenport et al in the La Blanca field, Hidalgo County, were extinguished during the week. The 7900-foot distillate producers, since cratered, were still out of control, but ultimately are expected to be choked in. This is the second time that a big blowout has occurred in the field, the other being the test preceding the completion of the first commercial producer.

Second completion pending in Henderson County field.

* * *

Survey shows water intrusion corrected in many wells.

Tyler, Texas.—Completions of a second oil producer in the Flag Lake pool, northwestern Henderson County discovery made last November, was assured when Sherman Hunt, Dearman and McMillan's Dawdy 1 cored oil sand in Woodbine at 3100-03 feet. Drill-stem test will be made before running casing. Location is short distance northeast of the same operators' discovery, and on lease farmed out by The Texas Company. Harry Hines, Hancock et al's A. R. Dillard 1, south offset to the discovery, was drilling at 2750 feet in Austin chalk, topped at 2509 feet. The latter is on a Shell Petroleum Corporation sublease.

Majors bought close-in leases as protection against the discovery, which was carried to the Travis Peak, then plugged back for completion in the Woodbine. Market for the high gravity oil production is restricted to tank truck deliveries to a Dallas refinery.

Exploration of the lower Trinity zones on the north edge of the Talco field has been launched by a co-operative test. Ajo Oil Corporation's Sanders 1, located on 4-acre lease, Franklin County, is deepening from 4374 feet, where it was previously abandoned as a Paluxy failure.

20 percent East Texas wells on pump; water increasing

Kilgore, Texas.—Artificial lifts were in service on 5478 wells, or more than 20 percent of the total producers in the East Texas field, according to a survey on field operations made during the fore part of January by engineers of the Texas Railroad Commission. The report credits the field with producing 85,133 barrels of salt water daily from 3475 wells, or an average of 24.49 barrels of water daily each.

Pumping equipment is utilized by 4930 of the non-flowing wells, while air-gas lift units serve 448 wells. Total pumping wells increased 654 during the last quarter in 1937, and 72 additional wells were placed on air-gas lifts. Formation water is being produced by 2389 of the pumping wells, and also by 97 of the air-gas lift operated wells.

Volume of water production gained

East Texas Lifting and Water Status

	October, 1936	January, 1937	April, 1937	October, 1937	January, 1938
Flowing wells making water	942	1,071	1,005	1,047	978
Pumping wells making water	850	1,042	1,518	1,967	2,389
Pumping wells immune from water	1,619	1,860	2,145	2,350	2,521
Total pumping wells	2,469	2,902	3,663	4,317	4,930
Air and gas lift wells making water	63	71	72	123	97
Air and gas lift wells immune from water	222	243	286	307	351
Total air and gas lift wells	285	314	358	430	448
Wells producing Woodbine water	1,827	2,151	2,560	3,026	3,462
Wells producing water other sources	28	33	35	19	13
Total wells making water	1,855	2,184	2,595	3,137	3,475
Woodbine water production in barrels	42,718	46,250	53,314	75,241	85,120
Water production in barrels other sources	72	77	44	28	13
Total daily water withdrawal in barrels	42,790	46,327	53,358	75,270	85,133
Average daily water production per well	23.07	21.42	20.56	24.72	24.49
Total completed wells	21,503	22,010	22,457	23,722	24,278

9863 barrels during the last quarter in 1937 in attaining a new peak level of 85,133 barrels daily. However, only 338 additional wells appeared on the new report. Total flowing wells making water decreased from 1047 to 978 during the last quarter.

Incomplete checkup on plug-back operations due to bottom-hole water lists 100 projects, and 45 wells attained complete water shut-off. Partial shut-off was credited to 30 wells, and 25 failed to curb the water production.

EAST TEXAS
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
JOINER AREA—		
Duo Oil Corp., Thrash 4-A (9-ac)	1200	3691
Gen'l American, Thompson 12 (7-ac)	7300	3754
Gulf, Crim 7 (42.61-ac)	3000	3801
Hanover, Tr., Johnson 2, (15.35-ac)	750	3809
Humble, Brightwell 7 (44.9-ac)	8400	3714
Silvey 59-A (460.56-ac)	7000	3680
Magnolia, Kee 8 (56.41-ac)	*	3790
Milford Oil Co., Thrash 10 (30-ac)	3600	3735
Shell, Brooks 19-A (176.4-ac)	2500	3725
Staley Oil Co., Hale 12 (40¼-ac)	3200	3722
Texas Canadian Oil Corp., Jackson 14 (46.02-ac)	4000	3727
Tide Water Associated, Pinkston 27 (134-ac)	7500	3814
Thrash 5 (15.69-ac)	4500	3731
Ward Oil Corp., Thrash 37 (200-ac)	6500	3732
KILGORE AREA—		
Francis Oil Co., Scoggins 8 (50-ac)	3500	3662
Gulf, Reeves 15 (78.7-ac)	6000	3583
Humble, Minor 15 (123.7-ac)	5200	3685
Reid 11 (70-ac)	2500	3689
Kemp et al, Laird-Harris 1, blk 138	1500	3530
Lacy et al, Reynolds 13 (22.89-ac)	1200	3551
Reynolds 14 (22.89-ac)	1500	3557
Magnolia, Radford 14 (75.05-ac)	9400	3621
Sheppard 7 (415.8-ac)	1200	3590
Pearson Inv. Co.-Harry Golden, Sanders 1 (26.4-ac)	*	3765
Stanolind-Noble & Co., King 8 (50-ac)	9000	3773
LONGVIEW AREA—		
Fain-McGaha Oil Corp., Bauknight 12 (53.4-ac)	8500	3587
Gen'l American, Adams 19 (102.65-ac)	10,000	3575
McGrede 24-a (109-ac)	8700	3638
Sheppard 16-a (57.45-ac)	8700	3572
Humble,-Wadley, Clements 13 (50-ac)	8500	3592
Magnolia, Todd-Stinchcomb 17 (111-ac)	10,000	3567
Margay Oil Corp., Chrristian 11-B (16-ac)	8600	3666
Marine Prod. Co., Richey 7 (12-ac)	8000	3572
Sinclair Prairie, Isley 18 (100.12-ac)	10,200	3750
Stanolind, Lee 4-B (35.07-ac)	*	3620
Stanolind-Sun-Atlantic, Hays 19 (102.63-ac)	9000	3563
Stanolind-Tide Water, Persons 28 (151.18-ac)	8000	3549
Sun-Seaboard, Akin 28 (163.4-ac)	10,000	3556
Haynes 39 (203-ac)	8700	3658
Texfield Oil Co., Shelton-Humble 1-a (43-ac)	2000	3732
Shelton-Humble 9 (43-ac)	2500	3724
Turner et al, Jones 13 (63.84-ac)	9000	3656
ANDERSON COUNTY (Boggy Creek)—		
Humble, Roberts 4	*	3645
FRANKLIN COUNTY (Talco)—		
Humble, Stewart 4 (35.01-ac)	376	4289
Magnolia, Maxton 6 (326¼-ac)	435	4300
FREESTONE COUNTY (Cayuga)—		
Amerada, Berk 3 (1057-ac)	2000	4026
WILDCATS		
ANDERSON COUNTY—		
Parsons & American Liberty Oil Co., Hemby 1	¶45 & 30	5487
CHEROKEE COUNTY—		
Gray & Wolfe, Dupree-Shell 1 (131-ac)	*	5170
UPSHUR COUNTY—		
L. & G. Oil Co., Williams 1 (315-ac)	*	4009
MARION COUNTY (Jefferson-Rodessa)—		
Heyser, Heard and Clardy, Lizzie Henderson 3, R. Bennington sur 360		6021

*Failures; †Junked; ¶Million cu. ft. gas.

New fields discovered in two counties of South Texas.

* * *

Important wildcats in three other counties testing.

Corpus Christi.—San Patricio and Jim Wells counties had new Gulf Coast pool discovery wells being completed, while Victoria, Jackson and Nueces County wildcats were on sands and testing.

Plymouth Oil Company's Mrs. F. Brigham et al 1, 8 miles southwest of Taft and 2 miles east of the White Point field, San Patricio County, was reported to have drilled plugs and was ready for a production test at 5665 feet, 7⅝-inch pipe having been landed on bottom. The well cored sandy shale and sand with oil odor at 5627-30 feet, sand with oil show to 5657 feet and good oil sand, well saturated, to 5665 feet.

A drill stem test was made at 5650-65 feet in which 1030 feet of 36.2 gravity oil, 50 feet of mud and sand and 135 pounds working pressure were recovered through ¼-inch and ¼-inch chokes in 10 minutes. The 35-foot sand section and excellent recovery on drill stem test encourages operators into classifying as a possible Plymouth type field, where several thousand acres of fine Frio sand production has been developed.

The well is located 2310 feet from the north and west lines of Section 62, George H. Pauls Subdivision of the Coleman Fulton Pasture Lands in an area to be known as the East White Point field.

This well is several miles northeast of the recently discovered Turkey Creek field of Nueces County, where a hot drilling program is commencing. This field has two wells on production and several outpost wells nearing the level at which the pay should be encountered.

Jackson County Test

Jackson County, on the other side of the district, has one operation in process of attempting a production test. Magnolia Petroleum Company's A. West Ranch 1, Musquiz Survey, after topping the Frio at 5325 feet topped a four-foot sand section just above its contract depth. The sand at 6490-94 feet gave sufficient promise that a drill stem test was attempted, but mechanical difficulties prevented its success. The hole is being reamed. This company has 15,000 acres, upon which this well is being drilled. It is 5 miles south of Vanderbilt.

Magnolia Petroleum Company's deep wildcat on the Riviera prospect in Klebrg County, was abandoned at 7500 feet. Dietz 1 is the second failure for this prospect so far this year.

Harry L. Edwards' D. L. Robertson Estate 1, northeast offset to the discovery well of East Telferner field, Victoria County, was running a test of oil sand 5620-24 feet. It previously showed 300 feet of oil, 620 feet of salt water, 60 feet of sand and 40 pounds pressure on a 10 minute drill stem test at 5114-29 feet. The well topped gas sand at 5091½ feet and had good oil sand 5116-28 feet. Another drill stem test at 5179-88 feet netted 18 stands of salt water in 12 minutes.

Richardson Petroleum Corporation was testing A. C. Erwin 1, probable 4000-foot east extension to the Saxet Heights field, Nueces County, in the deep sand. The well logged sand at 5169-79 feet and is bottomed just below 5200 feet.

H. H. Howell et al's O. Goldapp 1, La Vaca Grant, 6 miles southwest of Alice, was swabbing, showing little pressure, some oil, gas, water and drilling mud. The well likely will make a pumping producer to open a new pool for Jim Wells County. It logged sand section 3615-34 feet and set 5½ inch casing at 3612 feet. The test is a west offset to Talbott 1, completed several weeks ago as a small gasser through perforations at 3600-7 feet. The Talbott test's successful completion as an oil producer is believed to have been entirely mechanical difficulties.

On the Alfred prospect, also in Jim Wells County, Rowan and Hope, Inc's Adams 1, Waldron Subdivision, Survey 19, was waiting on orders after running electric formation tester at 5500 feet. It indicated a 10-foot sand section around 3200 feet, which gives promise of possible production.

Deep lime production possibilities indicated

San Antonio.—Encountering a showing in the Dobie section immediately overlying the Edwards limestone, Paul C. Teas and Maryland Oil Corporation's S. E. McKnight 1, 7200-foot Cretaceous operation in Dimmitt County, assumed the position as the key operation in South Texas. The showing, considered to be of minor consequence in this particular well, does indicate the possibility of deep limestone production on the Chittim anticline, major structural feature of the district.

The well, located in Section 23 and northwest of Carrizo Springs, has an elevation of 685 feet, derrick floor. It topped the Edwards formation at 7070 feet and was carried to 7116 feet. Efforts to run an electric formation

tester were only partly successful, the tool being lodged near the top of the Edwards. It was hoped that drill stem test of the formation could be run, but a dogleg in the hole around 4300 feet apparently will prevent this operation unless a tremendous amount of reaming is done. The hole, however, is contracted to 7200 feet and undoubtedly will be carried to that level. It is most interesting to note that more ambitious geologists predicted that the limestone would be encountered just below 7000 feet to prove a structure of material consequence.

Major companies and independent operators have closely watched this operation since it logged its first markers many weeks ago and its interest has been high during the entire period. Huge lease holdings along this trend have been affected by the information obtained from this well. While not definitely announced, it is understood from sources considered reliable that there will be a second 7200-foot limestone test drilled about 3 miles to the north, regardless of the outcome of the McKnight.

To the northwest and on the same Chittim anticline, Wellington Oil Company of Delaware is drilling two wells, one near the southeast corner of Maverick County and the other just east of the Chittim field. Both are 6500-foot Glenrose tests.

After cleaning out cement, Pagenkopf and Jamieson's Houston Estate 1, on the Frio Town prospect in Frio County, was again testing at 2651 feet. It is showing considerable water and some oil.

A new wildcatting play, mostly shallow wells has been commenced in the trend extending from Central Guadalupe County along the Balcones Fault zone through Bexar, Wilson, Atascosa, Medina counties. To the northeast of the new district, a number of wildcat failures were reported in the Austin chalk and Edwards limestone during the past few days.

Pettus sand development in South Texas revived

Beeville.—Pettus sand production sees a probable revival of activity with two new fields. One, 1 mile north of Normanna in Bee County, is on regular production, while the other, 7 miles west of Lagarto in Live Oak County, is in final stages of completion.

Dirks Brothers' Magnus Beck 1, Section 17, of Bee County, after coming in for an initial flow of 75 barrels per day has increased its flow to just above 100 barrels of 46.5 gravity crude per day through ⅛-inch choke, showing pressures of 300 pounds on tubing and 600 pounds on casing. The well was drilled to 4273 feet, casing landed on bottom and perforated at 4219-23 feet. Sand was logged 4215-26 feet.

Hantho-Nelson, Inc's A. McNeill Bell 1, in the A. Parks Survey, 7 miles west of Lagarto in Live Oak County, is washing after running liner. The well first attempted to complete after drilling out plugs, but would not flow, which apparently was due to the pipe being plugged. The test, bottomed at 5076 feet, has casing landed 5058 feet. Shale and shells were logged at 5058-61 feet, sandy shale and shale and sand streaks to 5073 feet and good sand to the bottom of the hole.

SOUTH TEXAS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
SAN ANTONIO DISTRICT		
CALDWELL COUNTY—		
Mc-Wag-Tree, Roberts 1, House Survey	*	2633
Martell, Young 2-E, Miller Survey	84.32	2335
BEXAR COUNTY—		
Ridge, Hamilton Land & Investment 1-A, Munor Grant	1½	400
EDWARDS COUNTY—		
Carter et al, Sweeten Ranch 1, GC&SF survey	*	6507
GUADALUPE COUNTY—		
Kreiter & Douglas, Oliver 1, Smith Survey	*	2375
WILSON COUNTY—		
Richardson, Heirholzer 1-A, Salinas Survey	*	1035
CORPUS CHRISTI DISTRICT		
ARKANSAS COUNTY—		
Atlantic, McCampbell Ranch 2-E, McCampbell Ranch Subd. (McCampbell)	175	7122
Atlantic, Porterfield Est 10-B, McCampbell Ranch Subd. (McCampbell)	575	7218
Baltic, Conn & Brown 1, McCampbell	550	7123
BEE COUNTY—		
Dirks Bros., Beck 1, Uranga Grant	125	4273
CALHOUN COUNTY—		
Buchanan & Blanco, Morris-Dunwoody 4, Heyser	650	5760
Buchanan & Blanco, Morris-Dunwoody 7, Heyser	850	5501
Sinclair Prairie, Bennett 8, Heyser (per 5490-94)	425	6028
Davis, Afflerbach et al 2, Criswell Survey	*	4485
KARNES COUNTY—		
Luling, Boyce 21, S. Burnell	325	3673
KLEBERG COUNTY—		
Magnolia, Dietz 1, Sec 7, 1st subd of Rivera Farm Lnd	*	7500

Deep wildcats abandoned in Mirando district

Laredo.—Mirando district received a material set back with 15 wells, several being key deep wildcats, being abandoned. This is the largest number in a single week in many months.

F. A. Gillespie and Sons' Hamilton 1, in the extreme northeastern portion of the county, topped Jackson at 2280 feet and was abandoned in the Yegua at 4030 feet. Magnolia Petroleum Company's A. Lopez 1, Section 82, south of San Diego, was stopped at 6950 feet. Southwood Oil Company's W. I. Nolen 1, 8 miles northeast of Benavides, quit at 6258 feet. These 3 wells are on a general trend with the Sweden-Benavides sector and were closely watched.

Bridwell Oil Company's J. G. Ancira 11, Section 19, and in the virtual center of production in the North Sweden field, Duval County, found either broken material or no sand in any of the producing zones and was abandoned at 5502 feet.

J. R. B. Moore and Paul L. Meaders' Garcia and Villareal 1, in Block 14, Section 786, Webb County, was swabbing after casing was perforated in the Rosenberg sand at 2324-34 feet.

Company, Well and Location	Init. Prod. Bbls.	Depth
LAREDO DISTRICT		
NUECES COUNTY—		
Baltic, Lawrence 1, Saxet	*	900
Seadbor, Luby 11, Luby	500	4353
Southern Minerals, King 5, Bentonville-King	¶20	4022
REFUGIO COUNTY—		
Houston, Pratt-Hewitt-Rocke 36, Refugio	900	6232
Nordan & Morriss, O'Connor 4, Tom Tomoconnor	1250	5970
Quintana, O'Connor 24-C, Tomoconnor	2700	5924
SAN PATRICIO COUNTY—		
Conroe, Dougherty 1, McGloin Survey	*	6516
Welder 92-C, Plymouth	650	5645
Welder 93-C, Plymouth	600	5498
Welder 94-C, Plymouth	550	5632
VICTORIA COUNTY—		
Guld, Schultz 2, Heyser	750	5492
Transwestern, McFadden Est. 4-A, McFadden (north)	¶2 & 10	4489
DUVAL COUNTY—		
Bridwell, Ancira 11, Sweden	*	5502
Colmena, DCRG 9, Colmena	30	1459
Cox & Harmon, Cuellar Bros. 6, Hoffman	75	2574
Hoffman 1, Hoffman	195	2768
Gillespie & Sons, Hamilton Ranch 1, Poitevent Sur.	*	4030
Humble, Murphy 3, Labbe	*	2952
Magnolia, Lopez 1, Survey No. 82	*	6950
Parr & Delaney, Puig 8, Sweden	375	4838
Reliance, Moyer 1, Sweden	150	5395
Republic, Buoy 3, Sweden	350	4790
Reynosa, Garza de Rodriguez 4, Seven Sisters	400	1496
Southwood, Nolen 1, Caballero Sur. No. 104	*	6258
Standard of Kansas, Southland Life Ins. Co. 8	75	4793
LASALLE COUNTY—		
Reed et al, Yeager 1, blk 7, sec 8, sur 39	*	1505
McMULLEN COUNTY—		
Howell & Richardson, Martin Heirs 2	*	580
Jones, Ezzell F-4, Ezzell	*	1605
Reynolds, Shiner Ranch 1, Steinhard sur No. 26	*	3009
STARR COUNTY—		
Fair, Inc., Flores de Pena 2-A, Samfordyce	250	2981
WEBB COUNTY—		
Cox & Harmon, Wise 4, Killam-Oilton	150	2001
Daubert & Lipscomb, Garcia 1, Killam-Oilton	*	2006
Davidson et al, Killam-Schott, sur No. 471	*	201
Gravis Jr. et al, Perez Heirs 1, Killam	*	2005
Killam, Garcia 35, sur 786	150	1982
ZAPATA COUNTY—		
Brown, Gutierrez 1, Cullinan subd.	*	2362
Dulup, Trevino 32, blk 14 sur 412	*	1165
Edwards, Garza Est. 1, Zorro Ranch, Villa Grant	*	1695

*Failures; †Junked; ¶Million cu. ft. gas.

OUR NEW

1938 Catalog

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The NEW DEAL SPECIALTY CO.

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OKMULGEE. OKLA.. U.S.A.

TEXAS GULF COAST

New Matagorda County field from Lower Marginulina.

* * *

Producer in Galveston Bay attracts immediate offset.

Houston.—A new oil field was opened in the Texas Gulf Coast February 18 when Pierce Estate's Fee 1, I. & G. N. Section 7, north of Van Vleck, Matagorda County, came in flowing an estimated 150 to 200 barrels of 33 gravity oil daily through an 11/64-inch choke with a tubing pressure of 450 pounds and a casing pressure of 1450 pounds. The well is flowing from Lower Marginulina sands at 6620 to 6624 feet. Seven-inch casing was set at 6619 feet. The well was washed for five hours last week and it failed to flow then swabbing was commenced. After heading several times it kicked off. It was first reported that the well was making 30 percent salt water but at last reports the well was flowing pipe line oil.

Humble Oil & Refining Company is preparing to move in a heavy drilling barge from Catfish Lake in South Louisiana to Galveston Bay where Standard Oil Company of Texas and Salt Dome Oil Corporation recently opened a new oil field. This will be the first sinkable drilling barge ever used in the Texas sector of the Gulf Coast. Humble Oil & Refining Company will offset the discovery well to the north.

Standard Oil Company of Texas and Salt Dome Oil Corporation's State 1 in Galveston Bay came in February 12 flowing 647 barrels of 36.2 gravity pipe line oil daily through a ¼-inch choke from Frio sands at 6030 feet. Tubing pressure was 1000 pounds and the casing was sealed. The oil was turned into a 6800-barrel barge. The operators are moving in two other barges, one a 3500- and the other a 2500-barrel barge. The discovery well was drilled to 6030 feet and logged 74 feet of formation showing oil and gas. Forty-six feet of the formation was sand and sandy shale showing oil and 25 feet was solid sand. Seven-inch pipe was set at 5955 feet.

Standard Oil Company of Texas and Salt Dome Oil Corporation have not announced any new locations. The next well the operators drill will also be from piling and then a drilling barge will probably be moved in.

It is expected that four rigs will be in operation in the field. The discoverers have approximately 8000-acres surrounding the discovery well while Humble Oil & Refining Company has approximately 2000-acres. No other operator has acreage in the area. The discoverers are operating the field on a 50-50 basis.

Cheek Water Increasing

Glenn H. McCarthy's Broussard Trust 1, Cheek area, C. Hillibrandt Survey, Jefferson County, continued to look disappointing last week. It was hoped that the salt water percentage of the fluid which the wildcat was making would decrease but according to reports it is increasing. Broussard Trust 1 made a potential test the past week and showed 122 barrels of fluid of which 103 barrels was 40 gravity oil. The balance was salt water. The gas/oil ratio was estimated at 4300 to 1. Tubing pressure was 2700 pounds and casing pressure 400 pounds. At the end of the week it was estimated that the wildcat was making 30 percent salt water. The derrick and rig is still mantled and operators will watch the flow and if salt water increases the well will be reworked. This well was completed at 7725 feet.

Strake Petroleum Corporation's Strunk 1, Lissie area, L. P. Jennings Survey, Wharton County, was drilled to 9500 feet

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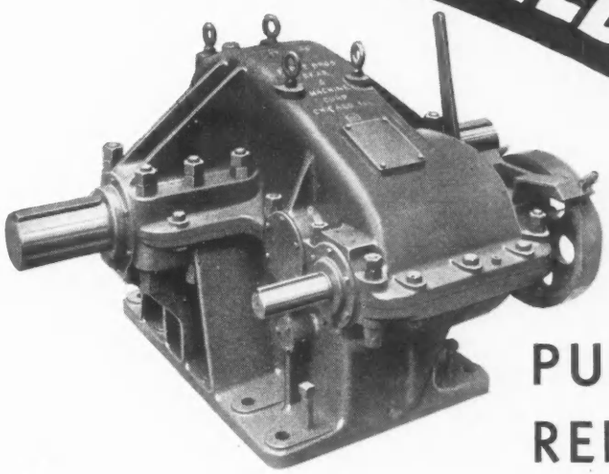

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and is reported not to have picked up Wilcox formation. While drilling to the bottom two sands are reported to have been logged. The first was from 6742 to 6763 feet which showed 8 ohms and 60 millivolts on an electrical logging device. The second sand was from 6918 to 6949 feet. It showed 7 ohms and 30 millivolts on the electric survey. Neither of the sands were tested. It is reported that the operator will make a new location in this area soon.

Fairbanks Extension

Amerada Petroleum Corporation and Stanolind Oil & Gas Company's Peters 1 indicates it will extend the new Fairbanks production 3000 feet southwest. Last week Peters 1 was running 7-inch casing to 6894 feet for a production test. Peters 1, W. K. Hamblin Survey, Harris County, cored broken formations showing oil, gas and salt water sands to the bottom after topping the sand at 6713 feet. Probably the best sand cored was from 6824 to 6827 feet. It topped the Cockfield at 6560 feet and was running approximately 60 feet lower than the dissovery well. The operators have made location for E. White 1, approximately 8000 feet east of the discovery well. It is 466 feet south of the north line and 466 feet west of the east line of the White 140-acre lease in the J. Clarkson Survey.

Jack Frazier will attempt to establish commercial oil production at Eureka gas field, Harris County. Last week he made location for Vollmer 1, 100 feet east of the abandoned H. B. & T. railroad right of way and on the line of W. Vollmer and R. Nieman tracts in the J. Reinerman Survey. It is approximately 1100 feet southeast of Houston Oil Company's Lackner 1, which was completed as a gas well at 7682 feet. The gas well was completed in the top of the sand and it is believed that Frazier will core further into the sand and set and make a commercial oil well. The operator has approximately 1000 acres in the area.

The second wildcat location was announced for Pearland prospect last week. Albert Plummer made location for Street 1, 900 feet from the southwest line and 330 feet from the southeast line of the D. H. Hunter Survey, Brazoria County. It is on a 200-acre tract which was sold to Albert Plummer by George Robinson for a cash consideration and a well. Around this location George Robinson has several hundred acres, Stanolind Oil & Gas Company has 923-acres, Glenn H. McCarthy, 173 acres. Street 1 is approximately 4000 feet north of Sam Dunman's J. J. Settegast 1, which was a new location the previous week. Pearland prospect has been active for the past year with leasing and royalty buying. Magnolia Petroleum Company has a large block in the area which was detailed by geophysics this year.

Flag Pond prospect, Brazoria County, will be tested soon. Luther C. Smith made location for Smith Fee 1, 183 feet east of the west line and 592 feet south of the north line of lot 12 of P. A. Rogers subdivision in the Z. Phillips Survey.

Orange Failure

Apparently Ryan & Thompson's Norwood 1, 2500 feet northwest of the discovery well for the deep sand on the southwest flank of Orange, Wm. Dyson Survey, Orange County, is a failure. Last week the well was down to 6140 feet in salt water sand and is about 100 feet low on structure. The well failed to pick up the 5900-foot sand.

Sun Oil Company's Seabreeze Land Company 1, Seabreeze or Willow Slough area, H. & T. B. Section 102, Chambers County, missed the regular producing sand and was drilling at 8522 feet last week in shale. Gas sand was logged from 8429 to 8438 feet and from 8507 to 8512 feet. It is northeast of production.

Dickinson, Galveston County, was extended slightly north last week by Pure Oil Company's S. Levine 3, W. G. Banks Survey. The well made 570 barrels of pipe line oil daily through a ¼-inch choke from 8119 feet. Casing was perforated in sand showing oil from 8075 to 8094 feet.

Another 10,000-foot test for the Texas Gulf Coast is Hamman Exploration Company's Crooker 1, workover at South Bay City field, Matagorda County. Last week the well was down to 10,009 feet in shale and was drilling ahead.

In the Wilson Creek area, Matagorda County, United North & South Development Company's Lambert 1, C. B. & M. Cotton Survey, was setting 5-inch casing at 7845 feet. The hole was cored to 7924 feet in sand and shale showing oil. Top of the sand was encountered at 7894 feet.

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TEXAS GULF COAST

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CLAY CREEK—		
Sun, Hunt 7	*	1921
DANBURY—		
T. F. Hunter, Blakeley Winston 1	*	2016
DICKINSON—		
Frank Bennett, Schroeder 3	588	8096
Humble, Peters 1	*	9355
Pure, Levine 3	570	8119
FIVE CORNERS—		
Texas Co., Pierce Estate B-13	288	5543
FRIENDSWOOD—		
Humble, Durwood 1	576	6042
Kildahl 1	510	6065
HARDIN—		
Atlantic, Murphy 1	241	7610
J. W. Frazier, Hanchey 2	536	7632
McMurtry 1	110	7617
Gulf, Hinson 2	560	7631
Humble, Partlow 1	528	7645
HASTINGS—		
Humble-Brown C-1	490	6095
Horstman 1	*	6223
Stanolind, Massey 1	639	6080
Pennock 5	598	5445
Pennock 8	581	6080
MANVEL—		
Sam Wilson, Rash 1	*	6003
HULL—		
Texas Co., Barrow 7 (wo)	163	5200
HUMBLE—		
Wilson O.I Co., Pickens 11	29	1300
MAGNET—		
Humble, Cockburn 6	127	5537
NOME—		
Shell, Carpenter B-6	529	6040
SILSBEE—		
Republic, Ellery 2	443	6967
SPINDLETOP—		
Stanolind, McFaddin 148	148	2975
TOMBALL—		
Humble, Bishop 1	528	5570
Shell, Bennett 1	421	5567
TURTLE BAY—		
Stanolind, Sherman Heirs 1	*	6688
WEST COLUMBIA—		
A. Moore, Gulf Oil Corp. 1	550	5390
Texas Co., Phillips 6	302	5700
CHAMBERS COUNTY—		
Salt Dome and Standard of Texas, State 1, in Galveston Bay	647	6030
WHARTON COUNTY—		
Strake, Strunk 1, Lissie area, L. P. Jennings sur	*	9500

*Failures; †Junked; ¶Million cu. ft. gas.

SOUTH LOUISIANA

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ANSE LA BUTTE—		
Austin B. Taylor, Begnaud 4	*	1970
BOSCO—		
Superior Oil Co., Larcade 5, (wo) dr to 10,432 ft, pb and comp	184	8085
CHARENTON—		
Pan American, Ecuer 1-A, dr to 10,317 ft, pb and comp	350	2640
Robicheaux 1	*	1932
DARROW		
Humble, Landry 2	576	6952
JENNINGS—		
Harry Fotiades, Washinton-Opelousas Oil Co. 1	*	6890
LAKE LONG—		
Fohs Oil Co., State 3, dr to 11,342 ft, pb and comp	500	9382
NEW IBERIA—		
Harry Fotiades, Gulf Refining Co. 4	350	4798
NORTH CROWLEY—		
Humble, Daly 1	*	9083
POTASH—		
Humble, Orleans Levee Board 33	*	606
VILLA PLATTE—		
Continental, Louisiana Land Improvement Co. 1	430	9040

*Failures; †Junked; ¶Million cu. ft. gas.

SOUTH LOUISIANA

Second Long Lake producer is 1320 feet north discovery.

★ ★ ★

Fausse Point test has oil indications at advanced depth.

Lake Charles.—Lake Long, Lafourche Parish, was extended 1320 feet north last week when Fohs Oil Company and Pilgrim Exploration Company completed the second well in the area. State 3, was drilled to 11,342 feet in water sand and was plugged back to 10,120 feet. Casing was perforated with 8 holes from 9376 to 9382 feet. The well came in flowing 500 barrels of 38.9 gravity oil daily through a 12/64-inch choke with a tubing pressure of 1300 pounds and a casing pressure of 300 pounds.

The discovery well in Lake Long area was completed in Miocene sands at 9365 to 9373 feet, flowing 400 barrels of 38.3 gravity oil. Instead of drilling State 2 the operators moved to State 3.

Lafitte, Jefferson Parish, was extended northeast last week by The Texas Company's Marrero 1, Section 21-17s-24e. The well came in flowing 1700 barrels of pipe line oil daily through a 3/8-inch choke after casing had been perforated with 268 holes from 9553 to 9605 feet. Marrero 1 was drilled to 10,275 feet in sandy shale and electrical log run. Seven-inch casing was set at 9731 feet and broken shows of oil logged from 9550 to 9584 feet. This is the second deep well for the operators to complete in the field in the past two weeks. No dry holes have been drilled. Already the field is estimated to cover 2500 acres and with future development it is believed it will be much larger than this. The Texas Company announced location for A. Marrero 3, 4663 feet north and 6708 feet east of the southwest corner of Section 20 and in Section 21-17s-24e, Jefferson Parish.

Considerable interest is being shown in The Texas Company's Fausse Point 4, Section 35-11s-8e, Iberia Parish. At the end of the week it was down to 7929 feet in sand showing oil after logging top of the sand at 7912 feet. This is the deepest well in the area to show oil. Fausse Point 2 was perforated from 6303 to 6553 feet with 250 shots and made 16 barrels of 34.6 gravity oil daily. Operators have drilled several wells in the area since Fausse Point 2 indicated there was oil in the district.

At Lake Hermitage, Plaquemines Parish, Gulf Oil Corporation made a drill-stem test in a deep sand last week and recovered mud. Lafourche Levee Basin District 7, Section 12-18s-25e, was drilled to 9770 feet and plugged back and perforated from 9275 to 9286 feet with 20 shots. A drill-stem test, open 55 minutes, showed 220 feet of mud and 200 feet of soft cement. A cement retainer was set at 9255 feet and perforations were squeezed.

West of production at Bayou Des Allemands, St. Charles Parish, Amerada Petroleum Corporation and Louisiana Land & Exploration Company was shut down on St. Charles Land Company 1, Section 13-15s-20e, waiting on cement to set. Last week casing was perforated from 5545 to 5555 feet with 20 holes and a 10-minute drill-stem test showed eight stands and one double of salt water and mud.

In the Woodlawn area, Jefferson Davis Parish, Union Sulphur Company made location for Calcasieu National Bank 2, 330 feet south and 330 feet west of the northeast corner of Section 12-9s-6w. It is near the operator's Calcasieu National Bank 1 which is shut in at 8282 feet and has a tubing pressure of 2850 pounds.

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SHEAR-RELIEF VALVE

NORTH LOUISIANA

Two Cotton Valley producing horizons are extended.

★ ★ ★

Contract 8500-foot test on Cartersville-Sarepta flank.

Shreveport.—Both producing horizons in the Cotton Valley field, Webster Parish, the Travis Peak (Holloway) and the Lower Marine (Bodcaw) were extended last week. The former horizon produces oil and the latter, gas distillate.

Completion of 2 Travis Peak producers in this field boosted the total from that horizon to 5. A. G. Oliphant's Sam Banks 2, C SE NW 34-21n-10w, elevation 217 feet, which topped Travis Peak at 5722 feet, was completed for 825 barrels daily flowing through ½-inch tubing choke. Total depth is 5804 feet.

H. L. Hunt's Hope 1, C SW NW 24-21n-10w, that logged Holloway sand from 5632 to 5642 feet, was completed at 5852 feet, flowing 20 barrels per hour to extend that producing horizon three fourths of a mile northeast.

The Lower Marine producing horizon was extended a half mile east with successful completion of Bodcaw Account 2 (well 48) SE SE 15-21n-10w, which was awaiting official 24-hour gauge. Total depth was 8422 feet; elevation is 200 feet.

Stanolind Oil & Gas Company's Pardee Company 1, c sw ne 36-21n-10w, 2 miles east of production, found the Holloway sand non-saturated, and was drilling ahead. This test, with 176-foot elevation, found base of anhydrite stringer at 4790 feet. Thirteen other tests are drilling at Cotton Valley.

Lisbon Extended

The producing Limits of the Lisbon field, Claiborne and Lincoln parishes, were extended a quarter-mile south last week when Delta Drilling Company's Wise and Tatum 1, C S½ NW NE 7-20n-4w, Lincoln Parish, was completed at 5341 feet, flowing 66 barrels hourly through ¾-inch choke, after using 4000 gallons of acid. The well kicked off without swabbing after the acid treatment, something unusual for Lisbon wells.

Five miles south of production at Lisbon, Hollyfield and McFarlane made two locations, H. W. Patton Heirs 3 and 4, SWc SE NE and SEc SE NE 2-19n-5w, respectively.

Rodessa Well Helped

Hoffman and Marr's Davis and Collett 2, J. S. Smith Survey, Cass County, Texas, part of Rodessa, which has been making only a little oil and much water from the Young horizon, was plugged back to the Dees horizon, casing perforated, and the well completed gauging 563 barrels in 24 hours through ¼-inch choke with gas/oil ratio of 452 to 1. This was an edge well and it may be found that other edge wells producing water in the Young may be similarly recompleted in the higher horizon.

Four miles northwest of nearest Cass County production at Rodessa, G. H. Chamblee and associates have spudded White-Walker Lumber Company 1, J. J. Potter Survey (280-acre tract). This is 1½ miles northeast of a recently started test by G. H. Vaughn at Ryley 1, J. Taylor Survey. Both operations are playing for a supposed lateral fault of the main Rodessa fault.

Testing was under way last week at Triangle Drilling Company's Herold A-2, NW NW 13-17n-12w, Sligo field, Bossier Parish, in the 3100 foot horizon of the red bed series of the upper part of lower Cretaceous which has added two small producers from this level at Sligo. Total depth is 3125 feet. In drill-stem tests the well flowed 16 minutes with a slight show of salt water.

Jerry Ryan of Shreveport has assembled a 2000-acre block around Section 3-11n-13w, DeSoto Parish, for a 3000-foot test to be spudded by May 15.

Magnolia Petroleum Company has contracted to drill an 8500-foot test on the north flank of the shallow Cartersville-Sarepta field, located in parts of Bossier and Webster Parish, in a 760-acre lease secured from Pardee Lumber Company in Sections 8 and 17-23n-11w, Webster Parish. The test must start by next July 3.

This area has been the scene of much geophysical exploration and considerable leasing in recent months. Besides acreage it already had in the vicinity, Magnolia Petroleum Company in addition to the 760 acres referred to also has leased considerable acreage in the last fortnight in township 23 north, range 12 west, Bossier Parish.

This will mark the second of two deep tests to be drilled on old shallow producing fields' flanks in Webster Parish by Magnolia which is now below 7200 feet on a 9000-foot test in the old Shongaloo field, Section 32-23n-9w, Webster Parish. In this latter area, W. F. Meadows, believed to be leasing for Magnolia Petroleum Company, has secured over 3000 acres in recent weeks, centering around Section 9-23n-9w.

The area between the northeast-southwest Rodessa fault, and the southeast-northwest Schuler trend, along the Louisiana-Arkansas line has been the scene of much exploration and leasing recently, rivaled only by the activity in the "Schuler trend." A deep test in the Haynesville shallow field, township 23, range 8 west, Claiborne Parish, is expected this year.

In a northeast play from the Miller County, Arkansas, part of Rodessa, Lide and Greer have been active recently in township 19, range 27.

Standard Oil Company of Louisiana transferred approximately 400 acres of its holdings in the Cotton Valley field, covering leases in Sections 13, 14, 23 and 24-21n-10w, to H. L. Hunt last week. Hunt is obligated to start a test within 20 days, to start a second test within 60 days and a third within 180 days, all to go to the lower Marine unless production is found above. Leases having production were retained insofar as sands below 6500 feet are concerned.

In the Lisbon field, The Sloan & Zook Company assigned SW SE 1-20n-5w, to Tippett Drilling Company. In DeSoto Parish, W. F. Bridwell is attempting to secure drilling of Glen Rose test. Continental Oil Company has secured approximately 7000 acres around Section 22-13n-8e, Franklin Parish, believed to be in the vicinity of a salt dome, discovered by shooting. E. T. Oakes and associates have re-assembled a block of 6000 acres formerly held by Gigantic Oil Company around Section 30-18n-1w, and probably will drill a test thereon soon. In Morehouse Parish, in township 22 north, range 6 east, The Texas Company and Sun Oil Company have been taking scattered leases recently. Ohio Oil Company has just moved a shooting unit into township 23 north, range 6 east.

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ARKANSAS FIELDS

North end Schuler-Buckner trend test to deepen

El Dorado, Ark.—Marking the northwest limits of the Permian lime exploration drilling campaign along a 220-mile line northwest-southeast in the Schuler-Buckner "trend," H. D. Easton, R. P. May and C. E. Murdock last week announced plans to deepen LaGrone 1, NE NE 5-12s-26w, Hempstead County, Arkansas, to 4500 feet to seek production in the truncated edges of the Permian lime.

This test has been shut down recently at 2944 feet, due to high water, following a sidetracking job. Location is 2 miles south and 5 miles east of Boettcher Oil & Gas Company's test in Section 28-11-27, which topped Pennsylvanian at 2185 feet without picking up any Permian and was abandoned in the Pennsylvanian at 2936 feet. This test logged only 85 feet of Travis Peak while LaGrone 1 has been in this formation for 600 feet. The nearest test to the south which went to Permian was E. H. Moore, Incorporated's Dale 2, Section 24-15-26, which logged Permian lime at sub-sea depth of 7028 feet and was abandoned in Permian lime at 7310 feet.

A mad scramble for leases in the Schuler "trend" in Columbia and Union Counties continued last week. Southeast of Magnolia, Columbia County, Tide Water Associated Oil Company was assigned a large block around Section 12-18-20, which has been in process of assembly for some time.

Southwest of Strong, Union County, in township 19, range 13, buying that had been at white heat recently has somewhat subsided with Fohs Oil Company, which started the play, securing approximately 1200 acres. Standard Oil Company of Louisiana was leasing around Section 28-18-16, Union County, after a shooting picture bore out a geological theory of a cross-fold in that vicinity. Hunt Oil Company and The Texas Company have bought considerable acreage recently around Section 5-19-11.

Joe Modisett will announce location within a few days for a Permian lime test near Strong, Union County, on a block of 2000 acres secured after geophysical work by Kerr-Lynn Oil Company, the acreage being in Sections 4, 5, 8 and 9-18-12. Standard Oil Company of Louisiana is rigging for its new Permian lime test, W. P. Phillips 1, SE NW 15-17-19. Both of these latter tests were reported last week as contemplated.

Kerr-Lynn Oil Company's Barnett 1, SE SW NE 14-17-20, Columbia County, Arkansas, wildcat approximately midway between the Buckner and Schuler fields, both of which have production from Permian lime, was ready to drill plugs and test last Thursday. Total depth is 7664 feet and the test logged 6 feet of saturation at bottom of the hole. Seven-inch casing was cemented at 7051 feet, 19½ joints off bottom where it hung; elevation is 321 feet.

Some believe that this location and the test now rigging up by Standard Oil Company of Louisiana, W. P. Phillips 1, SE NW 15-17-19, Columbia County, are on the same geophysical high. If the Kerr-Lynn test is a producer it will add much to the great leasing and drilling campaigns already shaping up in the Schuler trend. Some reports are to the effect that 23 known highs in South Arkansas are to be drilled this year.

The Lower Marine (Jones) sand at Schuler, Union County, added its seventeenth producer last week when Phillips Petroleum Company's First National Bank 1, SEc NE SW 17-18-17, was completed at 7539 feet, estimated 12 feet above top of Permian; elevation is 225 feet and Jones sand was topped at 7539 feet.

NORTH LOUISIANA
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CADDO PARISH (Rodessa)—		
Clark Oil Corp., Sharp C-1, 4-23n-16w	20	6045
CADDO PARISH (Dixie)—		
W. Dromgoole, Caddo School Board 6, 16-19n 14w	45	2445
CALDWELL PARISH—		
G. W. Zeigen et al, La. Cent. Lbr. Co. 12, 20-14n-3e	*	1767
CLAIBORNE PARISH (Lisbon)—		
Atlantic, Patton D-2, 29-21n-4w	1398	5247
J. R. McMurray, Bean 1, 32-21n-4w	500	5167
A. O. Olsen, English 2, 29 21n-4w	1440	5168
LINCOLN PARISH (Lisbon)—		
J. W. and L. P. Love, Patton Est. 2, 6-20n-4w	504	5316
Delta Drlg. Co., Wise & Tatum 1, 7-20n-4w	1580	5306
SABINE PARISH— (Converse)—		
Major Oil Co., J. E. Graham 1, 20-9n-13w	35	1662
WEBSTER PARISH (Cotton Valley)—		
A. G. Oliphant, Banks 2, 34-21n-10w	825	5804
Hunt Oil Co., Hope 1, 24 21n-10w	480	5852

*Failures; †Junked; ¶Million cu. ft. gas.

ARKANSAS
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
MILLER COUNTY (Rodessa)—		
Skelly, Thomas 2, 12-20-28	168	6040
OUACHITA COUNTY—		
A. H. Tarver, Smith 1, 16-14-19	*	2330
UNION COUNTY (Schuler)—		
Alice Sidney Oil Co., Morgan 3, 18-18-17	1248	7717
Phillips, First National Bank 1, 17 18-17	1056	7635
UNION COUNTY (Urbana)—		
Ark. Southern Oil Co., Simmons A-2, 15-18-13	30	2307

*Failures; †Junked; ¶Million cu. ft. gas.

Shreveport. — Twenty-seven drilling permits were authorized last week by the minerals division, Louisiana Conservation Commission of which 15 were for North Louisiana divided among the following parishes: Bienville, 1; Caddo, 6, of which 2 were for Rodessa; Claiborne, 4, all in Lisbon; Lincoln, 1, in Lisbon; Sabine, 1; Union, 1; and Webster, 1. The 12 in South Louisiana were divided among the following parishes: Ascension, 1; Calcasieu, 1; Cameron, 1; Jefferson, 2; LaFourche, 3; Plaquemines, 3; and Terrebonne, 1.

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ILLINOIS DEVELOPMENTS

Decker Township completion makes 1690-barrel flow

Olney, Ill.—Mammoth Producing & Refining Company's A. W. Bell 1, Section 28-3n-9e, Decker Township, Richland County, brought in a week ago, had initial production of 1690 barrels daily. A heavy McClosky saturation was struck at 3060 feet. Operators moved the cable tool outfit over to their nearby Brace-McCauley 1 which is to be deepened 10 to 15 feet in search of the second McClosky productive layer which was found so prolific at A. W. Bell 1. Initial production at the Brace-McCauley, completed two months ago, was 750 barrels a day and total depth was 3046 feet.

A large dose of acid in Max Pray's Harold Runyon 1, a half-mile northeast of the Brace-McCauley, resulted in an initial flow of 700 barrels daily. It dropped off to 15 barrels an hour after several days. Production is also from the second McClosky layer, the well first having been considered dry when the upper McClosky appeared too tight.

Morrison & German were to spud in the first well within the Olney city limits February 16. It is the George Conour 1, Section 34-4n-10e, and will be drilled with a rotary rig. These operators have a 30-day drilling commitment with C. E. Burch, owner of a 20-acre lease in Section 28-4n-10e, which will make it necessary to rush the Olney city well so that the equipment may be released for the Burch test.

The Olney city commission last week adopted two amendments to its recently enacted ordinance to control drilling within the city limits. The first reduces the bond required of drilling contractors from $40,000 to $5,000, and the second permits unlimited drilling on unplatted acreage in the city, but only one well for each block on platted areas. As originally passed, the ordinance restricted drilling to one well per block on both platted and unplatted areas.

Meanwhile in Clinton County, the Centralia city council was preparing an ordinance to permit unlimited drilling within the city provided that drilling contractors pay $100 for a permit and inspection fee for each well and obtain public liability and property damage insurance. A recent completion just west of the city limits resulted in considerable leasing activity within the city. The new Centralia pool was opened November 30, 1937, by Adams Oil & Gas Company's Schmitz 1 which had an initial production of 156 barrels daily from the Benoist sand at 1348 feet. It was this company's Hefter 1, barely outside the city limits, which unleashed a flurry of lease and royalty buying within the city and brought erection of three derricks within the city limits last week.

Carter Oil Company encountered 15 feet of saturated Benoist sand at 1947 feet at Douthit 1, Section 9-1s-2e, Rome Township, northern Jefferson County. The well was cemented last week preparatory to drilling in. Nearby, the company's Tate 1, Section 10-1s-2e, Rome Township, was pumping about 40 barrels of oil and 20 barrels of water.

ILLINOIS
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CLAY COUNTY—		
A. O. Olson et al, Irwin 1	200	3065
JEFFERSON COUNTY—		
Benedum-Trees, Owens 1	*	3150
MARION COUNTY—		
Cypress Oil & Gas Co., C. Adams 6	38	1451

*Failures; †Junked; ¶Million cu. ft. gas.

EASTERN FIELDS

Contract 7,000-foot test in Pennsylvania gas area

Pittsburgh.—O. E. Garrett & Son Company brought in one of the largest gassers in the Russell Section, Calhoun County, West Virginia, on the Wilson Fogle farm. It had a gauge of 1,500,000 cubic feet a day from the Injun sand, bottomed at 1890 feet. Number 2 is to be started immediately.

L. J. Houze Glass Company announced a location in the Wymps Gap sector, Fayette County, Pennsylvania, where the company has acquired leases on over 2000 acres. The location is on Chestnut Ridge, in a direct line with William E. Snee et al's Summit Hotel 1, deep discovery drilled last summer. Preparations are being made to carry the well to 7000 feet and the contract has been awarded to Fairman Brothers, of Wellsville, New York. The location was selected by Ray V. Heenan, Morgantown, West Virginia, geologist. William E. Snee et al's Summit Hotel 2 was drilling below 6350 feet last week on the way to the Onondaga.

Dr. P. O. Glenn & Son, Bradford operators, drilled an oil well on the old Siggins and Helum farm, on the Neiltown-Tionesta road, western Forest County, Pennsylvania, which was bailing between 10 and 15 barrels a day last week. It was completed in the Third sand, topped at 850 feet, and was the second drilled by these operators on this property. The No. 1 was good for one barrel a day.

In Clarion County, Pennsylvania, Dr. J. R. Bangert drilled a well on his lot in Shippenville borough to get gas to supply his house and office, but it turned out to be a 4 barrel pumper when completed 12 feet in the Third sand. No wells had been drilled in the immediate vicinity of the new well.

Evjen et al are fishing below the Oriskany in their Dusenberry 1 wildcat, Warren County, Pennsylvania. An encouraging gas flow was encountered at the top of the Oriskany a week ago but it rapidly dwindled. If successfully completed, it will be the first Warren County deep test to have this distinction in over a year—at least five others having been abandoned during 1937.

A show of gas at the top of the Oriskany in the Allegany County, New York, test of New Penn Development Company on the Johnson farm, Willing Township, was drowned out by salt water which intruded at 4745 feet, depth at which the test was abandoned. The sand was topped at 4741 feet and the gas show was recorded at 4744 feet.

EASTERN FIELDS
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
OHIO		
ATHENS COUNTY—		
Ohio F. S. Co., Chase 2	*	1292
Kachelmacher Est., Franks 2	*	945
N. C. Leeper, Bryson 23	*	940
GUERNSEY COUNTY—		
Seward O&G Co., Arbuckle 1	¶	1165
LICKING COUNTY—		
G. H. Long, Varner 6	20	3027
LORAIN COUNTY—		
Dillon & McFrederick, Mousseau 1	¶.45	2555
MUSKINGUM COUNTY—		
Hopewell G. & F. Co., Enoch 1	¶2.83	4015
SUMMIT COUNTY—		
East Ohio Gas Co., Hartong 2	¶2.17	4234
TUSCARAWAS COUNTY—		
East Ohio Gas Co., Maconel 1	*	4500
WASHINGTON COUNTY—		
J. O. Herlan, Decker 4	3	998
Hope Cons. & Ref. Co., Pryor 3	¶.13	2020
Hall & Henning, McKee 5	¶.10	1980
Swigle et al, Palmer 37	*	590
WOOD COUNTY—		
Geo. W. Spohn et al, Dishong 1	¶	1497
WEST VIRGINIA		
BRAXTON COUNTY—		
Pittsburgh & W. Va. Gas Co., Howell 7629	¶.25	1850
CABEL COUNTY—		
West Va. Gas Co., Childers 1	¶.43	3300
National Gas Co., Morris 1	¶.20	2772
Walden Gas Co., Nicols 1	¶.11	3035
CALHOUN COUNTY—		
Chemical Oil Co., Miller 3	6	2191
CLAY COUNTY—		
Virginia G. & O. Corp., Brown 44	25	1918
GILMER COUNTY—		
Pittsburgh & W. Va. Gas Co., Floyd 7648	¶.05	1815
S. A. Hays 7646	¶.05	1608
KANAWHA COUNTY—		
United F. G. Co., W. H. O'Dell 4761	¶15.77	4993
V. C. Tate 1	¶5.58	4860
Linden Drlg. Co., Kidd Hrs. 1	¶5.65	....
West Va. Gas Co., Good et al 1	¶2.15	5125
LINCOLN COUNTY—		
Sand Creek Gas Co., Hager 3	*	3977
RITCHIE COUNTY—		
W. D. Gribble, Strickler Hrs. 1	15	1825
J. W. Jones, W. Va. Oil Co. 33	¶.05	700
ROANE COUNTY—		
Blond et al, Moore Hrs. 1	*	1747
KENTUCKY		
DAVIESS COUNTY—		
J. P. Warren, Waltrip 1	*	1524
HANCOCK COUNTY—		
J. C. Ellis, Smith 10	7	400
LAWRENCE COUNTY—		
Kentucky Oil Prod., Rose 2	3	841
LEE COUNTY—		
McCoun & Wissing, Combs 9	50	1138
Petroleum Explo. Co., Haupt 4	5	....
Fleiger Oil Co., Combs 1	2	1012
McLEAN COUNTY—		
South Penn Oil Co., Nall 2	75	....
MARTIN COUNTY—		
Kentucky-W. Va. Gas Co., Ward 560	¶.20	2777
OHIO COUNTY—		
New Deal O&G Co., O'Dell Hrs. 13	100	536
Globe Oil Co., Graham 24	40	545
A. Teller et al, Medcalf 2	20	625
Nollem O&G Co., Crowe 3	20	651
INDIANA		
PERRY COUNTY—		
Grewe et al, Metz 1	*	475
PENNSYLVANIA		
ALLEGHENY COUNTY—		
South Penn Oil Co., Ryan 3	3	1932
O. Miller, Werner 2	¶	....
GREENE COUNTY—		
Peoples Nat. Gas Co., Orndoff 1	¶.16	3400
WASHINGTON COUNTY—		
Carnegie Nat. Gas Co., Schussler 1	¶.20	1144
Beedle & Clark, Rankin	¶	2852
NEW YORK		
ALLEGANY COUNTY—		
New Penn Dev. Co., Johnson Est. 1	*	4745
STEUBEN COUNTY—		
Sylvania Corp., Allen 1	¶9.50	4131
Williamsport O&G Co., Lampson 1	¶9.00	3803

*Failures; †Junked; ¶Million cu. ft. gas.

NEW MEXICO

Vacuum operations spurt following line anouncement

Hobbs, New Mexico.—Three new locations allotted the Vacuum field the past week gives this rapidly expanding Lea County lime area a total of 10 operations. Four tests, offsetting flowing wells, have cemented the oil string, and are drilling below the 4100-foot level. An adequate market outlet for the 8 wells completed in the 4500-foot Permian zone, and future additions is assured through the entrance of the Texas-New Mexico Pipe Line Company with an 8-inch line. Announcement of this project was published last week.

Southeast extension for the area is to be sought by Magnolia Petroleum Company by starting operations on State 1-K, C NW SE 31-17s-35e. Completion of a producer will force the drilling of more than a dozen progressive offsets due to unusual division of lease ownership in the immediate area. The above company and The Texas Company are the largest owners of proved leases.

Amerada Petroleum Corporation made its entry as an active operator in awarding rotary contracts for State 1-V-A, C SE SW 23-17s-34e, and State 1-V-B, C NE SW 36-17s-34e.

The Texas Company's M. A. Corbin 1, located 8½ miles west by south of Vacuum production, was drilling with cable tools in hard lime at 4150 feet. Small show of oil in big lime at 3786-98 feet, with an elevation of 3984 feet, induced the company to cement 7-inch at 4021 feet.

Standard rig has been installed by Continental Oil Company et al to make a production test of Marsh 1-A-31, C NE SE 31-20s-39e, eastern Lea County wildcat reported last week showing oil saturation in lime at 4311-46 feet, with an elevation of 3571 feet.

Total of 12 locations were listed the past week for Lea County. The Mattix sandy-lime area shared top honors with the Vacuum field. Operations have been started on Western Gas Company's E. C. Davis 1, C SW SE 33-23s-37e; Skelly Oil Company's Toby 1, C SW SW 7-24s-37e; and Shasta Oil Company's Woolworth 2, NE NW NW 28-24s-37e.

Difficulty was experienced by Texas Pacific Coal & Oil Company in mudding off heavy gas flow from State 8-A, C SE SE 7-22s-36e, Eunice lime area, following loss of returns and blowout at 3447 feet. Production was rated above 80,000,000 feet daily. Drilling was resumed late last week after cementing off the bulk of the gas production by running a squeeze job as an alternative for an extra string of casing. Gulf Oil Corporation's Greer 1, C NE SW 21-22s-36e, one location south of production, flowed 37 barrels fluid, 9 percent bs&w after using 5000 gallons of acid at 3842 feet, or 302 feet sub-sea. It is a southwest offset to a recent failure. Phillips Petroleum Company was the only contributor of new work for the field, having made locations for State-New 2, C E½ SE NE 26-20s-36e, and State-Hudson 2, C NE NW 30-20s-37e. Continental Oil Company et al made location for Sanderson 8-A-14, NE NW SE 14-20s-36e, near the southwest edge of the Monument field.

Hobbs field regained an active status when Jack P. Cusack, Inc., made location for Turner 1, near the school site, and situated 1140 feet from east and 1640 feet from south lines 34-18s-38e.

In the Penrose sandy-lime area, operations have been started by Shell Petroleum Corporation on Grizzell 2, C NE SE 8-22s-37e. Phillips Petroleum Company and Pure Oil Company, early prospectors in the Langlie field with negative results, have rigged up to drill M. C. Woolworth 1, C SE NE 33-24s-37e, replacing an abandoned location.

NEW MEXICO Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
EDDY COUNTY—		
Franklin Pet. Co., McIntyre 1, nw nw sw 20-17s-30e	135	3270
Geo. F. Getty Oil Co., State 1-E, ne sw sw 16-17s-31e	140	3567
Grayburg Oil Co., Burch 10, se ne ne 19-17s-30e	35	3242
Repollo, Parke 1-A, nw ne ne 22-17s-30e	425	3450
LEA COUNTY (Eunice)—		
Cities Service, Closson 2-AA, c se ne 18-22s-36e	3000	3805
LEA COUNTY (Langlie)—		
Gulf, Elliott 2, c ne se 15-25s-37e.	200	3395
Plains Prod. Co., Mosley-Repollo 2, sw ne se 34-24s-37e	360	3470
Sun, Lanehart 2, c ne se 20-25s-37e.	20	3620
LEA COUNTY (Penrose)—		
Gulf, Stebbins 2, c sw nw 5-22s-37e.	118	3770
LEA COUNTY (Skelly)—		
Skelly, Sims 5, c se nw 10-23s-37e.	400	3625

*Failures; †Junked; ¶Million cu. ft. gas.

SOUTHEASTERN STATES

Fifth Lamar County salt dome test is failure

Jackson, Miss.—Marking the end of 14 months of exploration, at least for the time being, Sun Oil Company and associates last week abandoned Mrs. Kate Talley 4, located 2200 feet south and 1350 feet east, NWc 33-4n-15w, Lamar County, Mississippi, at 8673 feet in salt, logged at 8650 feet; elevation is 374 feet.

This was the fifth test drilled on a salt dome discovered by the same operators in Section 28-4n-15w, in January, 1937. The first test was drilled after extensive geophysical exploration and the drilling of a series of core hole tests. The first real hole drilled encountered the salt slightly below 2500 feet, and operators moved southward down structure with each successive hole. None of the tests showed any oil or gas.

Completions

MISSISSIPPI

Company, Well and Location	Init. Prod. Bbls.	Depth
JONES COUNTY—		
Snow-Black Pet. Co., Fox 2, 31-7n-12w	*	4080
LAMAR COUNTY—		
Sun et al, Mrs. Kate Talley 4, 33-4n-15w	*	8673
Snow-Black Pet. Co., Miller & Jewell 1, 3-4n-15w	*	4062

*Failures; †Junked; ¶Million cu. ft. gas.

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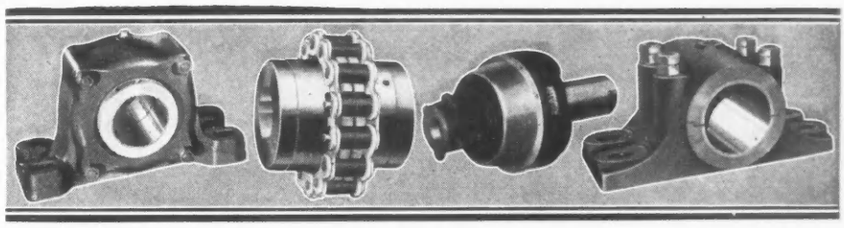

Record depth well in Kern County drilling at 13,312 feet.

* * *

Two wells at Kettleman producing below 10,000 feet.

Los Angeles.—Two wells at Kettleman Hills, North Dome, are now on production below 10,000 feet, but neither are making as much oil as had been expected, and one of them is wet. The action of these two wells indicate that further work and experimenting is necessary before it will be known just what the new deep sand means to Kettleman Hills.

Kettleman North Dome Association's No. 4-18J, bottomed at 11,746 feet and plugged to 10,810 feet, is now producing 1383 barrels of 28-gravity oil and 1304 barrels of water. During first 24 hours, the well made 1080 barrels of fluid, 7 percent of which was oil, while on second day oil increased to 47 percent. It is believed the water situation will clear up, but it may be necessary to attempt to shut it off. This well proved the new deep sand.

The second well to tap the new and deep sand at Kettleman Hills was Superior Oil Company's Huffman 5, Section 29-21-17, which was deepened from 8680 to 10,746 feet for a daily production of 563 barrels of 46.3-gravity clean oil and 10,500,000 cubic feet of gas. In this hole, 7-inch was landed at 10,086 feet and first production was reported on February 11. Operators probably will do further work before the well is officially classed as a completion.

The action of the two wells indicates that the deeper oil-producing zone underlies most of North Dome, and very likely a number of old producers will be deepened, since most of these wells started with large holes and were completed sufficiently large to permit further drilling.

CALIFORNIA Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
KETTLEMAN HILLS—		
Kettleman No. Dome Assn., 27-6Q	540	9075
SANTA MARIA VALLEY—		
Pacific Western, Del Porto 3	830	4198
BELRIDGE—		
Belridge Oil Co., 28-1	1070	8450
CANAL—		
Ohio, K.C.L. E-4	2185	8177
MOUNT POSO—		
Ring Oil Co., Rodgers-Jones 2	350	1753
ROUND MOUNTAIN—		
D. G. Vedder, Bell 1	360	1736
TEN SECTION—		
Shell, 85-B-25	2000	8220
FRUITVALE—		
Calif. Western, K.C.L. 1	40	3521
LOST HILLS—		
Argo Pet. Corp., Farnsworth 1	*	1297
MOUNTAIN VIEW—		
Texas Co., Bastain 1	*	4620
SAN LUIS OBISPO COUNTY—		
Little Cuyama Oil Co., No. 2	*	1500
VENTURA COUNTY—		
Richfield, McFarland 1	*	7883
DOMINGUEZ—		
Shell, Reyes 93	330	7106
INGLEWOOD—		
Standard, L. A. 1-84	350	4175
LONG BEACH—		
Texas Co., Gray 4	100	4420
ROSECRANS—		
Barnsdall, O'Dea 19	875	7600
WILMINGTON—		
Black Gold Corp., 7	250	3636
Caminol Co., Harbor 1-6	500	3050
Richfield, P. & G. 2	150	3122
Union Pacific Ry., Offset 46	1170	2860
Superior Oil, Black Bay 1	445	2940
Black Bay 5	440	2940

*Failures; †Junked; ¶Million cu. ft. gas.

World's Deepest Hole

Interest is centered in California on Continental Oil Company's K.C.L. A-2, Wasco area of Kern County, deepest hole in the world, which continues to drill and core ahead, with total depth at 13,312 feet night of February 15. Last core showed only hard shale with no sand and no oil showings of any kind. It had been expected a new formation would be picked up at about 13,300 feet, the same zone found by Union Oil Company's Kerco well, but this zone has not been found yet.

The Chamber of Commerce at Bakersfield, county seat of Kern County, is in process of arranging for a national hook up broadcast from the floor of the derrick of the deepest well in the world, which will be another world record, since no such broadcast has ever before been attempted.

Richfield Oil Corporation is negotiating with Barnsdall Oil Corporation, looking to the construction of a pipe line into the new Newhall oil field. Barnsdall Oil Corporation now has two producers in the new field, with no pipe line connections. Should the pipe line be built, the company will considerably increase drilling activity. At present only one well is drilling.

Sunray Oil Company of Tulsa, Oklahome, has closed a deal to take over the holdings and production of Royalty Service Corporation in the Wilmington field and will operate 52 wells. Several other small concerns have arranged for Sunray Oil Company to handle their leases and wells. The terminal sand in the Wilmington field is proving to be very productive, 4000 to 5000 barrels resulting from new completions. These new wells are casing off the Ranger, or upper zone, and they can go back to this upper production horizon when conditions require.

A new company has entered Kern County. Western Plains Oil Company, with offices in the de Young building, San Francisco, has recently closed a large leasing campaign in the Carrizo Plains area, and a portion of Section 7-31-21 is included in the area under lease. J. C. Howard, petroleum engineer, recently from New York, will be in charge of field operations.

There is considerable new activity in the old Torrance field, in the development of a new zone. New wells are showing a higher gravity and are bottomed around 5000 to 5100 feet. A recent completion was Albertson Oil Company's Peyton 1, located near 233rd St. and Narbonne, total depth 5120 feet, came in for 150 barrels of 24 gravity clean oil on the pump. The cut is cleaning up. A number of other companies are taking over old leases, and in many instances old producers. The activity at Torrance probably will show a marked increase in 1938 over the recent years. The new zone produces a higher gravity oil than the old wells of lesser depth. C. C. M. Oil Company, subsidiary of Santa Fe Railway Company, is a very large holder of leases in this old field, and probably will become rather active later in the year.

In the northwest portion of the old Yorba Linda field in Orange County a new and deeper zone is being developed. Shell Oil Company pioneered the deeper zone with several core holes, and it is indicated that new wells will produce in excess of 1000 barrels. Several companies are entering the new area, taking over old leases, and preparing to drill new holes.

Wheat 1, Union Oil Company's offset to its own Acquistapace producing well near the Pacific Coast railroad tracks in the west side area of the Santa Maria Valley field, has been completed, pumping 441 barrels of 16.2 gravity oil in 23 hours. This well was bottomed at 4181 feet, with casing set at 3850 feet.

Union Oil Company has spudded in a prospect well between the Mountain View field and Arvin, in the northwest corner of Section 15-31-29. This wildcat, to be known as Berry 1, is beyond the south end of the field, between the recently completed Houchin well and the old producing area.

California shipments up

Los Angeles.—The movement of crude oil and petroleum products from California in tankers and in packages showed an increase of 15,252,000 barrels in 1937 over 1936, according to figures compiled by the Los Angeles office of the American Petroleum Institute. The total movement to points outside of the natural California trade territory was 77,726,000 barrels in 1937, against 62,474,000 barrels in 1936. The largest increases were shown in the movement to Pacific foreign, which means mostly Japan.

R. A. BROWN, SR., president and managing director of Brown Oil Corporation, Ltd., and R. A. Brown, Jr., Turner Valley operator, were in Toronto February 11. They planned to go to Ottawa for a session of the Dominion tariff board inquiry which resumed February 14, returning to Toronto late last week for a meeting of directors of the corporation.

MICHIGAN FIELDS

Early thaw halts most field activity.

* * *

Deep drilling tests meet with difficulties.

Mt. Pleasant, Mich.—Earliest spring thaw and freshets in a 10-year period, this week had not only definitely placed a damper on a drilling boom in the new Edenville district, Midland County, but likewise had pulled operations in other areas down to nearly a standstill. Paved roads offered about the only sure traffic with many of the state and county gravel roads next to being blocked. Few field roads in either the Edenville district or the Bentley area (Gladwin County) could be negotiated with auto or truck early this week.

Not only has the early thaw crippled plans of operators to push development in Edenville, but likewise, it has played havoc with moving oil from the discovery well. Road conditions made it necessary to completely shut in the discovery producer, rated with an 850-barrel potential, for 5 days last week, with an average since completed of less than 50 barrels marketed daily.

Regardless of road conditions, operators expected to have some degree of relief by the close of this week. Simrall Pipe Line Corporation announced plans in conjunction with owners of the well, to lay 2 miles of temporary 2-inch line to a loading rack on a hard surface road.

At the same time officials of Simrall Pipe Line Corporation, an affiliate of Standard Oil Company of Ohio and Roosevelt Oil Company, plan to construct 13 miles of 6-inch for a permanent system into the field. The new line will go directly south from the field to Greendale station, tying in at that point with the 6 and 8-inch line which runs into Mt. Pleasant and south to Toledo, Ohio. Construction operations are due to start within 10 days.

Shut in most of the time due to inability to move oil, Chapman, Devonian and Associated's State 1, Section 27-16n-1w, Edenville Township, Midland County, Dundee lime (3792 foot bottom hole) so far has been tested comparatively little. Operators likewise called off original plans to deepen in the Dundee. Mammoth Producing & Refining Corporation managed to beat the thaw and had the west offset drilling early this week. No other rigs had been completed out of 11 projected by other operators.

Deep test plans of Michigan operators were either junked or at a standstill this week.

Gulf Oil Corporation's Citizens Bank 1, 36-17n-4w, Clare County, first test in a 7000-acre block, developed between 16 and 18 million feet of gas between 1263-1278 feet in Michigan stray sand, and will be saved as a gas well due to close proximity to Gas Corporation of Michigan's distribution system. The company plans to skid rig but may not get started for two weeks or more on another deep hole.

Gas likewise has upset plans of Socony Vacuum Oil Company in Home Township, Montcalm County, on Hansen 1, Section 22-12n-6w. To properly protect gas sands, operators were required to set a string of 8-inch at 1319 feet, to shut off a 5,000,000-foot Stray sand gas flow. Now it will be necessary to run a 6-inch string at about 1500 feet to shut off Marshall brine water, and carry only a 5-inch hole to the Dundee. Originally operators planned to carry an 8-inch hole into the Dundee.

Mammoth Producing & Refining Corporation, issued orders to junk Oard 1, Section 25-18n-1w, Buckeye Township, Gladwin County, at 4330 feet, in Monroe lime salt.

Michigan acreage under lease increases

Mt. Pleasant.—Approximately 1,727,171 acres are under lease in Michigan at the present time, representing a 146,571-acre increase over the same period in 1937, according to a survey made by leading operating companies. Sun Oil Company with approximately 380,000 acres holds the biggest single block, although Gulf Refining Company, Pure Oil Company and Shell Petroleum Corporation, hold better than a quarter million acres each.

SAMUEL FAULKNER, driller employed by various oil companies in Mexico during the past 11 years, died of heart failure in Tampico on February 12. He was a native of Belfast, Ireland, and was 39 years of age. Faulkner is survived by his father, who resides in Belfast. Interment was at Tampico on February 13.

MICHIGAN Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ALLEGAN COUNTY—		
Mich. Devonian, Goodman B2, ne ne ne 13w	75	1618
Muskegon Dev. Hardy 3, sw sw ne 21-4n-13w	75	1586
ARENAC COUNTY—		
Chapman Oil Co., McTaggart 1, sw ne ne 26-19n-3e	25	2005
Linabury, McTaggart 2, ne ne se 26-19n-3e	70	2031
Ross & Bernier, Buhl 1, ne ne ne 8-20n-4e	40	2671
W. J. Soverign, Peavy 1, ne se ne 9-20n-4e	22	2654
D. F. Jones, Sibley 1, nw nw se 33-20n-7e	*	2400
CLARE COUNTY—		
Gulf & American, Bank 1, nw nw nw 36-17n-4w	¶17	1278
GLADWIN COUNTY—		
T. F. Caldwell, Emmott 3, sw se se 12-18n-1w	110	3628
Bell & Blunt, McMahon 2, sw nw sw 25-18n-1w	75	3595
OGEMAW COUNTY—		
Muskegon Dev., Garnett 3, nw se nw 28-22n-2e	170	2737
W. G. Lewis, Crowe 5, nw sw ne 36-22n-2e	280	2617

*Failures; †Junked; ¶Million cu. ft. gas.

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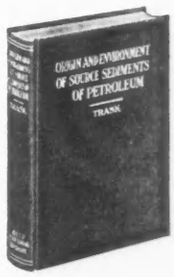

This book, recently off the press of the Gulf Publishing Company at Houston, embodies the results of five years research on the part of scientists assigned to this study by the American Petroleum Institute in carrying on the work made possible by the John D. Rockefeller gift of a quarter of a million dollars to be spent in fundamental research.

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IMPORTANT WILDCAT TESTS

ALABAMA

CHOCTAW COUNTY—Joe Modisett et al's McCorvey 1, se sw sw 20-9n-2w, elev 120 ft, owdd, td 7520 ft.

HOUSTON COUNTY — Rice O&G Co.'s Oakley Est. 2, se nw sw 9-3n-29e, sd 4975 ft.

MOBILE COUNTY — Grand Bayou O&G Co.'s J. A. Stafford 1, sw sw 24-7s-3w, dk and mir. Prine's King 2, ne ne 4-1n-4w, elev 135 ft, 10-in csg 300 ft, sd for 8-in csg 1100 ft (1100 ft s of No. 1).

ARKANSAS

CLAY COUNTY—Canadian American Oil Co.'s Smith 1, c ne nw 9-20-8, elev 375 ft, top Nacatosh 800 ft, sd 1005 ft shale.

CLEVELAND COUNTY—Marwick & Olds' Aubrey Vance 1, nw nw 18-11-11, rur.

CRITTENDEN COUNTY—Manning & Martin, Inc.'s Cartwright 1, se nw sw 16-7n-8e, sd 4230 ft sand and shale.

DESHA COUNTY—Columbia Fuel Corp.'s Victoria Cross 1, sw sw 34-8s-3w, rur.

COLUMBIA COUNTY—Kerrlyn Oil Co.'s Barnett 1, se sw ne 14-17-20, elev 321 ft, top Permian lime 7618 ft, cored lime sulphur odor 7630-39 ft, cored 7648-49 ft taste of gas, cored saturated lime 7659-64 ft, set 7-in csg 7051 ft, arr drill plugs, td 7664 ft. Standard of La.'s Bodcaw Lbr. Co. 1, c se ne 18-16-22, dr 4680 ft; D. E. Thomas 1, c nw se 8-16-22, dr 2200 ft. W. P. Phillips 1, se nw 15-17-19, rur.

HEMPSTEAD COUNTY—Easton, May & Murdock's R. M. LaGrone 1, ne ne 5-12-26, arr deepen, td 2944 ft.

LA FAYETTE COUNTY (Buckner)—Lyons & Neely's Lillian Taubel 1 (Tatum fee), c se nw 18-16-22, top first anhydrite 3279 ft, top massive anhydrite 3298 ft, dr 6120 ft. L. E. Tennyson, Jr.'s Fee 1, sec nw ne ne 13-16-23, mim.

LITTLE RIVER COUNTY—Henan & Coe's W. D. Waldrop 1, woc 10-in surf csg. J. G. Strahan et al's Dierks Lbr. Co. 1, sw se 21-12-28, sd 2032 ft lime and shale.

LONOKE COUNTY—J. W. Eddington et al's Anderson 1, nw ne 7-4-9, rur.

MILLER COUNTY—F. F. Earles' General American 1, sec sw 20-14-26, rur.

OUACHITA COUNTY—A. H. Tarver et al's Mrs. Guy Smith 1, se ne sw 16-14-19, spd dry, abn, td 2330 ft.

ABBREVIATIONS

The following abbreviations, signs, etc., are used in completions and wildcat reports in THE OIL WEEKLY.

*—*dry hole abandoned well.*
‡—*salt water (completions).*
†—*junked and abandoned.*
¶—*million feet of gas.*
abd—*abandoned.*
bbls—*barrels.*
br—*building rig.*
bs—*basic sediment.*
csg—*casing.*
co—*cleaning out.*
dd—*drilling deeper.*
dk—*derrick.*
dr—*drilling.*
fsg—*fishing.*
ft—*feet.*
hfw—*hole full of water.*
in—*inches.*
lcn—*location.*
m—*milling.*
mim—*moving in materials.*
mit—*moving in tools.*
mot—*milling on tools.*
n, s, e, w—*north, south, east, west.*
oih—*oil in hole.*
owdd—*oil well drilling deeper.*
owpb—*old well plugging back.*
pb—*plugged back or plugging back.*
r—*reaming.*
rog—*rig on the ground.*
rur—*rigging up rotary tools.*
rust—*rigging up standard tools.*
sd—*shut down.*
sdtr—*sidetracking.*
sg—*show gas.*
si—*shut in.*
so—*show oil.*
so&g—*show oil and gas.*
spd—*spudding.*
sr—*straight reaming.*
sw—*salt water.*
td—*total depth.*
ur—*underreaming.*
wih—*water in the hole.*
wo—*workover.*
wocs—*waiting on cement to set.*
wosr—*waiting on standard rig.*

CALIFORNIA

FRESNO COUNTY

COALINGA—J. M. Conlon's No. 1, 25-19-14, rig. Shell's No. 1-36, 36-19-14, dk.

JACALITOS CREEK—Dauphin Dev. Co.'s Boone 1, 20-21-14, td 3775 ft, rig blew down, dr pipe in hole.

PANOCHE—J. A. Gautier's Hubbard 1, 12-14-11, sd 510 ft; Hubbard 2, lcn.

JACALITOS HILLS — Jacalitos Pet. Co.'s Associated 1, 14-21-15, td 5862 ft, redr at 4768 ft.

GUIJARRAL HILLS—Petroleum Securities Co.'s Gatchell 2, 18-20-16, dr hard shale 5490 ft, fair cuts 5314 to 5320 ft.

HURON—Pure Oil Co.'s S. P. 1, 31-18-17, td 10,401 ft, milling on iron.

CIERVO—Superior Oil Co.'s No. 1, 20-16-13, dr shale 4153 ft.

KERN COUNTY

MARICOPA—Frank Abbott's No. 1, 20-11-23, td 1730 ft, rur.

MIDWAY-SUNSET—American Empire Oil Co.'s No. 1, 20-31-24, sd.

DEVIL'S DEN—Amerada Pet. Corp.'s Beer 5, 22-26-19, td 6717 ft, fsh. Den Pet. Co.'s Bates 1, 20-25-19, sd 4716 ft. Gibson Oil Co.'s Alferitz 3, 14-25-18, dr sand 100 ft. Little Major Oil Co.'s Jester 1, 36-25-18, sd 140 ft.

CUYAMA VALLEY—Calif. Prod. Co.'s Job 1, 6-10-24, dr shale 1420 ft.

FRUITVALE—Calif. Western Oil Co.'s K.C.L. 1, 14-29-27, see completions. Shell's No. A-58, 29-29-27, dr shale and gray sand 4560 ft.

MOUNT POSO—Carter Oil Co.'s No. 2, 3-27-28, td 1475 ft, co; No. 3, rig. Ring Oil Co.'s K.C.L. 16-1, 16-26-28, sd 300 ft.

BELRIDGE—Chico-Martinez Oil Co.'s Exeter 1, 1-29-20, td 1062 ft, plug 1050 ft, bailing, all oil. Taylor-Wallace's F. K. Land 1, 12-29-21, spud 2/8, dr. General Pet. Corp.'s St. Helens 1, 12-28-20, dr shale 7485 ft.

ROUND MOUNTAIN—Coast Explo. Co.'s No. 1, 6-28-27, td 1857 ft, dr pipe froze, circulating oil. Richfield's Olcese 1, 17-28-29, td 1591 ft, redr at 1090 ft.

WASCO—Continental Oil Co.'s K.C.L. A-2, 8-27-24, dr in hard brown shale, 13,285 ft, ditch showings. Seaboard Oil Corp.'s K.C.L. C-1, 26-27-24, sd 10,213 ft.

ROSEDALE—Continental Oil Co.'s K.C.L. D-1, 10-30-26, dr shale 5625 ft.

ARVIN—General Pet. Corp.'s Pauley 1, 22-31-29, sd 500 ft. Petrex's No. 1, 32-31-30, td 3150 ft, rigging heavier equip. Union Oil Co.'s Berry 1, 16-31-29, rur.

GRAPEVINE—Honolulu Oil Corp.'s 33-1, 33-12-19, td 8005 ft, sd, may abn, dips 70 degrees. Petrol Corp.'s Reserve 32-2, 32-11-19, dr shale 5554 ft, gas show. Universal Cons. Oil Co.'s Tejon 1, 33-11-19, td 4988 ft, plug 4634 ft, swabbing oil and water, may test on pump.

CALIENTE CREEK—Geo. W. Johnson's No. 1, 33-29-30, dr shale 990 ft. Ray Stevens' No. 1, 22-30-30, lcn.

McKITTRICK—Par-Mer Oil Co.'s No. 1, 6-31-22, td 2150 ft, rur. Rocima Oil Co.'s No. 1, 20-30-22, td 3186 ft, plug 1425 ft, to test.

NO. MOUNT POSO—Dr. M. Pottenger's Orcier 1, 34-25-28, spud 2/6, dr shale.

WHEELER RIDGE—Richfield's K.C.L. 1, 28-11-20, lcn.

KERN FRONT—A. J. Rubenstein's Lillian Kelly 2, 20-28-27, td 3352 ft, to test.

STRAND—Shell's K.C.L. A-72, 14-30-25, dr sand and shale 8133 ft.

SAN EMIDIO—Shell's No. 4-26, 26-11-22, dr shale 7486 ft.

TEN SECTION—Standard's K.C.L. 15-1, 27-30-26, td 8410 ft, plug 8072 ft, shut in.

LERDO—Standard's No. 18-1, 29-28-26, lcn.

SEMITROPIC—Standard's Randolph Com. 2, 14-27-23, td 9536 ft, plug 7612 ft, wocs 7 in at 7400 ft.

GREELEY AREA—Superior Oil Co.'s K.C.L. 9, 3-30-26, td 7870 ft, redr at 4998 ft.

SO. MARICOPA—Texas Co.'s Pioneer 1, 33-11-23, dr shale 6900 ft.

KERN FRONT—Vernon & Wheeden's Robinson 1, 28-28-27, sd 2540 ft.

EDISON—Wood-Callahan Oil Corp.'s Porter 1, 20-30-29, lcn.

MISCELLANEOUS

GLENN COUNTY—Ohio Oil Co.'s Willard 1, 18-20-2, sd 4505 ft; Willard 1-A, rur.

KINGS COUNTY — Pyramid Prod. Co.'s Retherford 1, 27-24-18, dr shale 2090 ft.

SAN JOAQUIN COUNTY—Standard's Weil-Zuckerman 2, 25-2-4, dr gray shale 8141 ft.

SAN MATEO COUNTY—Wilshire Oil Co.'s Cowell 1, 20-6-5, (Half Moon Bay), dr hard shale 7363 ft.

SOLANO COUNTY—Amerada Pet. Corp.'s McCormack 1, 1-3-2, td 4385 ft, to test. Richfield's Potrero 1, 10-1-4, lcn.

SUTTER COUNTY—Buttes Oilfields' No. 3, 2-15-1, td 6950 ft, plug bottom, sd.

TULARE COUNTY—Crusader Oil Co.'s No. 1, 1-24-27, spud, rur. Magnet Oil Co.'s A.O.G. 3, 29-24-24, sd 7555 ft.

SANTA BARBARA COUNTY—General Pet. Corp.'s Erburu 18, 32-5-30, rig; Erburu 22, rig.

MONTEREY COUNTY—Amil A. Anderson's Hillman 1, 15-24-14, sd 4001 ft. Elba Oil Co.'s Elba 1, 6-12-1, sd 4021 ft; Elba 2, rig.

SAN LUIS OBISPO COUNTY—Ajax Pet. Co.'s No. 1, 27-26-13, rur. Cholame Synd.'s Jack 2, 10-25-15, sd 3641 ft. Little Cuyama Oil Co.'s No. 2, 4-10-26, td 1500 ft in shale, abn. Loma Grande Oil Co.'s Lewis 1, 28-31-13, rig. Western Plains Oil Co.'s Clark 1, 26-27-14, 4010 ft. Vanguard Oil Co.'s Clark 1, 26-27-14, sd 4360 ft, bad roads.

SANTA BARBARA COUNTY—E. C. Arnold's Arnold-Apache 2, 8-8-33, td 6370 ft, pumping 50 bbls 28 grav., cut 50 percent. Carpinteria Oil Co.'s No. 1, 34-4-2, wocs 11 in at 50 ft. O. C. Field's Santa Rita 1, 11-7-33, td 3358 ft, fsh. C. B. Gautier's No. 17-1A, 22-4-26, sd. Pima Oil Co.'s Morganti 1, 13-9-35, td 1782 ft, to test on pump. Standard's Las Flores 1, 27-9-33, dr shale 4840 ft. A. E. Tweedy's No. 1, 34-5-31, sd 1675 ft. United Western Oil Co.'s No. 1, 16-7-30, sd 2830 ft. Wilshire Oil Co.'s Hollister 1, 35-5-30, dr shale 960 ft.

VENTURA COUNTY—Joint Test, (General Pet., Honolulu, Richfield, Shell, Standard and

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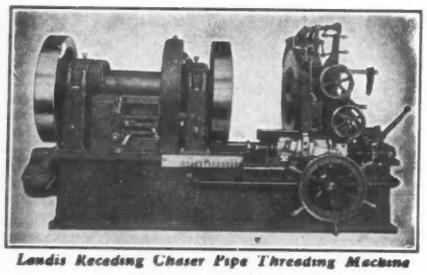

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Texas Co.), No. 1, 15-1-22, (Oxnard area), sd 3150 ft. Oxnard Oil Co.'s Banoni 1, 10-1-22, (Oxnard area), td 6302 ft, plug 6200 ft, sd. Vaca Oil Explor. Co.'s Lennox 1, 6-1-21, (Oxnard), td 2885 ft, 320 bbls 10 gravity oil. Richfield's McFarland 1, 13-2-21, (Camarillo area), td 7883 ft, abn. Texas Co.'s Edwards 1, 19-2-21, (Camarillo area), td 6111 ft, fsh; Yale-Richardson 1, 13-3-21, td 2275 ft, wocs 13⅜ in at 1905 ft.

SOUTHERN CALIFORNIA

PALMDALE—Antelope Valle Pet. Co.'s No. 1, 17-6-12, technical spud, idle.

NEWHALL—Barnsdall's Rancho S. F. 3, 26-4-17, lcn. Nos. 1 and 2 are on production. Townsley Canyon Oil Co.'s Hammond 1, 8-3-16, td 4102 ft, sd 4102 ft, due to storm. West Coast Dev. Corp.'s No. 1, 27-4-16, sd 1295 ft.

PICO CANYON—Downey Oil Corp.'s No. 1, 36-4-17, sd 2550 ft.

LA MIRADA—Carmenita Oil Co.'s Ravera 1, 21-3-11, rur.

PALOS VERDES—Hunter-Devlin & Associates' No. 1, 17-4-14, sd 5402 ft.

TICK CANYON—Mint Canyon Pet. Co.'s Jennings 1, 35-5-14, sd 1525 ft.

BREA CANYON—Pressel, Perry & Tull's Thornhill 1, 30-2-9, sd 4560 ft.

MONTEREY PARK—W. E. Ramsey's Garvey 1, 27-1-12, sd 3507 ft, may deepen.

PALOS VERDES HILLS — Rolling Hills Pet. Co.'s P. V. 1, 27-14-14, sd 3910 ft.

CASTIAC—Royal Lands Corp.'s R. H. 1, 8-4-17, sd 330 ft.

GARDENA—Texas Co.'s Garlena Com. 5-1, 30-3-13, dr shale 7660 ft, no showings.

SAN BERNARDINO COUNTY — Selegna Dr. & Prod. Co.'s Abacherli 3, 12-3-8w, td 3013 ft, iron in hole. Southern Counties Pet. Co.'s No. 1, 22-2-8, rig.

FLORIDA

LAKE COUNTY—Oil Dev. Co. of Fla.'s Gulf Expl. Co. 2, se se 17-24s-25e, elev 120 ft, pb to 2600 ft, temp. abn, old td 6126 ft.

LEVY COUNTY—Fla. Oil Discovery Co.'s Sholtz 2, sw sw ne 9-15s-13e, sd for more drill pipe, td 2620 ft.

NASSAU COUNTY—St. Mary's River Oil Corp.'s Hilliard Turpentine Co. 1, nw ne se 19-4n-24e, elev 110 ft, cemtd off caving hole at 3935 ft, woc.

POLK COUNTY—Edw. A. Hill's Polk County Lbr. Co. 1, nw nw ne 32-25s-25e, dk.

SUWANEE COUNTY—Wm. G. Blanchard's Lucy Cotton 1, se ne 35-3s-11e, elev 70 ft, sd for heavier rig 200 ft.

KANSAS

BARBER COUNTY—Palmer Oil's Warwick 1, cnw 29-31s-10w, dr 3130 ft. Carter & Wentz' Lytle 1, cne nw 6-32s-14w, dr 1630 ft.

BARTON COUNTY—Price' Hammeke 1, ne ne sw 12-18s-12w, swab down and 1200 ft oih overnight, co. Martin & Foraker's Dick 1, ne sw sw 31-19s-11w, mim and sd. Shell's Ehrlich 1, sw sw sw 1-16s-14w, dd to 3296 ft, 2800 ft oih. Day's Feltes 1, se se ne 14-16s-12w, sd 1875 ft. Sinclair Prairie's Oeser 1, ne ne se 17-16s-11w, dr plug to 3068 ft, 800 ft wih 9 hrs. Texas' Lowry 1, cnl nw sw 2-17s-13w, set 7-in csg 3323 ft rust 3324 ft. Murfin's Rexroot 1, nw nw se 14-17s-13w, lcn. Crown Pet.'s Schartz 1, sw se nw 7-20s-11w, dr 535 ft. Price' Wondra 1, nw nw ne 10-17s-13w, ru. Sinclair Prairie's Frederick 1, sw sw se 16-16s-11w, surf.

BUTLER COUNTY—Steinbuchel's Fox 1, nw se ne 25-26s-3e, sd 1010 ft. Dustin's Miley 1, se nw ne 17-27s-5e, dr 810 ft. Saco, Kansas & Gulf's Pettit 1, sw nw sw 21-28s-6e, mim.

CHASE COUNTY—Duffy's Leedy 1, ne nw nw 26-22s-9e, sd 1300 ft.

CHAUTAUQUA COUNTY — Harrison's Brown 1, ne se ne 19-34s-10e, td 820 ft, abd. Siegle's Temple 1, sw sw sw 31-32s-12e, td 400 ft, abd. Sooby's Davis 1, sw ne nw 29-33s-10e, sd 1504 ft.

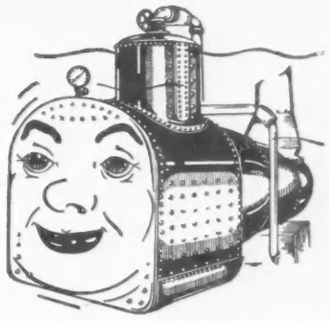
CLARK COUNTY—Olson Oil's Lehman 1, se se sw 2-32s-21w, dr 6674 ft. Olson Oil's Watkins 1, sw sw nw 23-32s-21w, pb to 6837 ft, woc.

COWLEY COUNTY—Dickey's Kansas G&E Co. 1, ne ne ne 22-34s-3e, dr 3505 ft. Trees & Talbott's McMinn 1, ne ne nw 16-31s-6e, dr 2570 ft. Brewer's McDaniels 1, sw sw sw 24-30s-4e, cel. Palmer's Neimiller 1, ne ne ne 14-30s-4e, dr 1845 ft. Brewer's Clark 1, ne se nw 6-31s-4e, dr 2410 ft. Wakefield's White 1, nw nw ne 4-33s-4e, dr 550 ft.

EDWARDS COUNTY — Douglas & Gear's Meade 1, se se nw 35-25s-16w, sdo.

ELLIS COUNTY—Skiles' Jensen 1, sw se ne 26-12s-18w, sd 2910 ft. Duwe & Farris' Hadley 1, se ne se 12-11s-18w, set 7-in csg 3120 ft, rust 3146½ ft, bad cem job. Bradley's Jensen 1, nw nw se 36-11s-19w, sho sulph wtr. Continental's Baumrucker 1, ne ne sw 25-14s-16w, dr 3030 ft. Helmerich & Payne's Stebbins 1, nw nw se 7-13s-20w, dr 3598 ft. Muth's Penney 1, cnl ne se 29-14s-18w, sd 350 ft. Witt & Sheri-

"THIS IS MY 'TRUE CONFESSION'



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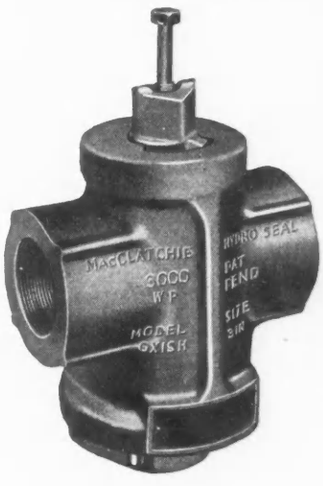

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dan's Hall 1, nw sw ne 1-12s-17w, lcn. Hays & Sackrider's Windholtz 1, ne ne ne 2-13s-16w, dr 2790 ft. Central Pet.'s Foster 1, csl se nw 33-11s-16w, dr 969 ft. Western Kansas' Cole 1, ne se se 24-11s-20w, lcn. Carter's Foster 1, se se nw 1-15s-16w, lcn.

ELLSWORTH COUNTY—Colonial's Hogy 1, nw nw sw 16-16s-10w, cem 6-in csg 3332 ft. Wixon's Peterman 1, sw sw sw 28-17s-10w, dr 3170 ft.

FINNEY COUNTY—Atlantic's Nunn 1, se se ne 27-21s-34w, rot rig.

GRAHAM COUNTY—Continental & Cities Service' Morel 1, cw½ e½ ne 15-9s-21w, lcn.

GRAY COUNTY—Reynolds' Watkins 1, csw 32-28s-28w, rot rig.

GREENWOOD COUNTY — Whittaker & Johnston's Cannon 1, cel se nw 8-26s-13e, td 1504 ft, rng 5-in csg. Nichols' Central Life Ins. Co. 1, sw sw se 35-25s-12e, spd and sd. Whittaker's Bressner 1, nw nw se 8-26s-13e, ru mach.

HARPER COUNTY—Franklin Drlg.'s Waltz 1, ne ne sw 24-34s-6w, dr 3248 ft.

HARVEY COUNTY—Nat'l Ref. Co.'s Brown 1, nw se ne 22-23s-2w, dr 3100 ft.

JACKSON COUNTY—Lemmick Oil's Marble Savings Bank 1, cne ne 26-9s-14e, sd 510 ft.

JEWELL COUNTY — Hollingsworth Bros.' Wolfe 1, nw sw se 14-4s-8w, spd.

LANE COUNTY—Phillips Pet.'s Kees 1, cse se 3-19s-30w, dr 4763 ft.

McPHERSON COUNTY—Pulse' Boesker 1, se se nw 29-20s-1w, rig. Phillips Pet.'s Galle 1, nw nw ne 11-21s-2w, dr 3275 ft. Archer & Crane's Templin 1, nw sw se 32-17s-3w, dr 2745 ft. Darrak-Aurell's Decker 1, sw sw se 12-21s-2w, rur.

MEADE COUNTY—Pacific Mid-West's Rexford 1, ne se sw 8-30s-29w, sd 200 ft. Barnett's Adams 1, sw sw ne 22-34s-30w, rot rig.

NESS COUNTY—Jones & Lane's Page Milling Co. 1, se se nw 36-18s-26w, co 3265 ft. Marshall's Anderson 1, sw sw nw 23-16s-24w, spd and sd. Trojan's Moses 1, csw nw 10-18s-25w, sd 500 ft.

OTTAWA COUNTY—Babcock Oil's Copeman 1, cnw ne 18-10s-2w, pits.

PHILLIPS COUNTY—Davidson's Elliff 1, se ne ne 35-5s-18w, sd 600 ft.

PRATT COUNTY—Cities Service & Atlantic's Delaney 1, csl ne 13-26s-12w, surf.

RENO COUNTY—Schneider's Kroecker 1, ne ne ne 12-22s-5w, dr 3977 ft. Carey's McPheeters 1, ne ne nw 22-26s-8w, dr 3460 ft. Witt's Fair 1, nw se se 4-22s-8w, pot. 326 bbls oil, comp. Cohen's Teter 1, se se sw 3-23s-5w, ru and sd. McCole's Mathews 1, sw nw nw 15-24s-10w, dr 2170 ft. Skelly's Gorham 1, sw sw se 32-25s-10w, dr 4305 ft. Pulse' Payne 1, sw nw ne 4-22s-7w, dr 3785 ft. Cities Service' Kreie 1, cnw 27-23s-10w, dr 1010 ft.

RICE COUNTY—Skiles' Campbell 1, se se ne 28-19s-9w, p. 10 bbls oil per hr; Aw/2000 gals, no increase, comp. Price' Gemeinhardt 1, ne ne se 18-18s-10w, td 3306 ft, 2800 ft oih 30 hrs. Herndon's Froning 1, nw nw nw 15-18s-8w, td 3405 ft, abd. Schneider's Sterling College 1, se sw se 28-20s-8w, set 12-in csg 133 ft, woc. Cities Service, Carter & Continental's Habiger 1, sw sw nw 18-18s-9w, set 10-in csg 244 ft, woc.

ROOKS COUNTY—Producers' Ham 1, sw sw nw 25-7s-19w, sd 330 ft. Graham's Fike 1, sw sw sw 9-9s-17w, td 3339 ft, co 3338 ft. Witt & Sheridan's Morrison 1, nw se sw 29-10s-17w, rot rig. Elwell's Zimmerman 1, ne ne nw 15-9s-18w, dr 1830 ft. Duwe & Farris' Hancock 1, nw sw sw 21-10s-18w, set 12-in csg 202 ft, woc.

RUSSELL COUNTY—Emrich's Anderson 1, ne se sw 33-15s-11w, spd and sd. Parks' Gorham Est. 1, sw nw ne 19-15s-15w, spd and sd. Jones' Kuhnle 1, se se nw 4-15s-12w, set 15-in csg 420 ft. Hess' Reinhardt 1, ne ne sw 36-12s-14w, dr 2780 ft. Smith & Unruh's Sitelow 1, nw nw nw 32-11s-14w, dr 385 ft. Atlantic's Boxberger 1, ne se nw 10-15s-14w, ru.

SEDGWICK COUNTY—Murfin's Martin 1, se se nw 18-28s-1e, swb 45 bbls oil 24 hrs, comp. Talbott's Downs Est. 1, se se nw 32-28s-2e, testing. Union O&R.'s Howell 1, sw sw sw 6-29s-1e, co 2400 ft. Hudson's Fulton 1, ne ne se 35-28s-1e, fsg 1550 ft. McKnabb's Garrett 1, se sw sw 18-29s-1e, dr 2150 ft. Steinbuchel's McAdams 1, sw sw ne 28-29s-1e, dr 3329 ft.

STAFFORD COUNTY—Hipple's Moses 1, nw nw sw 9-22s-13w, pb to 3635 ft. Aw/300 gals, flo 1¼ bbls fluid per hr, 10 percent oil. Terry & Feaster's Heggy 1, ne ne sw 26-33s-11w, td 3888 ft, hfw, abd. Terry & Feaster's Negley 1, sw sw ne 23-22s-12w, sd 3743 ft. Lindsay & Bailiere's Tiepermann 1, sw sw nw 32-22s-12w, dr 3663 ft. Cardinal & Carraker's Sittner 1, sw sw sw 4-22s-12w, td 3700 ft, shot with 10 qts 3694-98 ft, swb 40 bbls wtr and 5 bbls oil, 5 hrs. Carter's Andress 1, cnl se 2-21s-13w, rust 3554 ft. Shaffer's Newell 1, ne ne se 20-24s-11w, td 4085 ft, abd. Stanolind's Walker 1, ne ne sw td 3625 ft, rust. Carlock's Gates 1, se sw ne 34-22s-11w, dr 3075 ft. Rust's Hullman 1, sw sw sw 5-22s-12w, dr 3844 ft. Knight's McNickle 1, se se ne 2-24s-11w, cel. Nat'l Ref. Co.'s Bonham 1, sw sw se 28-25s-12w, dr 3090 ft. Stanolind's Hahn 1, ne ne nw 14-22s-13w, set 10-in csg 268 ft, woc. Hamilton's Hitz 1, ne ne nw 23-22s-13w, dr 2300 ft. Stanolind's Hill 1, ne ne sw 2-23s-12w, dr 1845 ft.

SUMNER COUNTY—Saco's Phipps 1, sw se ne 24-30s-1w, spd and sd. Jones' Stunkel 1, se se sw 2-30s-1w, rig. Shawver's Stewart 1, nw nw se 4-32s-3w, dr 3561 ft.

TREGO COUNTY—Carlock's Kinzel 1, sw sw sw 9,-13s-22w, sud and sd. Manning & Martin's Lynd 1, nw nw sw 16-11s-21w, rur.

WOODSON COUNTY—Reeser's Weide 1, nw nw se 18-25s-14e, sd 1150 ft. London & Mendenhall's Slough 1, ne ne sw 9-24s-13e, dr 1050 ft.

NORTH LOUISIANA

BIENVILLE PARISH—Gulf's Goodpine Oil Co. 1, se sw 25-14n-8w, elev 157 ft, massive anhydrite 5303-5420 ft, dr 8122 ft, red and black shale. DeSoto O&G Co.'s Wm. Ashley 2, c sw se 15-16n-10w, ru and sd; Wm. Ashley 3, c nw se 15-16n-10w, lcn. Hunt-Seaboard's Hodge-Hunt 1, se nw 36-17n-6w, rur.

CADDO PARISH—Olsen Drlg. Co. et al's Sharpe 1, c nw ne 10-18n-16w, dr 3460 ft. A. D. Robinson et al's Dickson 1, 22-20n-14w, 5 3/16-in csg 2400 ft, ran electrical tester, td 2805 ft lime, set short string of 4-in csg, arr to perf at Tokio.

CATAHOULA PARISH—G. E. Foster et al's W. S. Peck 1, c s½ 39-10n-8e, 16-in csg 20 ft.

CLAIBORNE PARISH—Union Prod. Co. et al's Brownfield 2, c se nw 5-19n-5w, elev 235 ft, pb to 8850 ft, straightening crooked hole off 22 degrees, td 9964 ft shale; Kilpatrick A-1, 11-19n-6w, coring 5800 ft.

CONCORDIA PARISH—Edw. A. Addey et al's Pasternach 1, c nw sw 49-8n-9w, setting csg 480 ft.

DE SOTO PARISH—Clear Lake Oil Co.'s Woolums 1, nw nw 29-12n-12w, cored sand so, sd for csg, td 2694 ft. La. Seaboard's Lawrence 1, sw ne 36-12n-14w, dk.

FRANKLIN PARISH—Southern Star Pet. Co.'s Grayson 2, sw ne 36-12n-6e, sd 1755 ft.

LINCOLN PARISH—E. T. Oakes, H. D. Easton et al's N. L. Griggs 1, c sw 36-18n-1w, elev 199 ft, running swabbing machine after shooting csg 5932-41 ft, td 6260 ft.

MADISON PARISH—Continental Oil Co.'s Singer Mfg. Co. 1, c ne ne 3-15n-11e, mim.

MOREHOUSE PARISH—W. J. Furlong, Jr. et al's E. M. Clark 1, 10-20n-7e, elev 103 ft, set csg to protect hole, arr core 6142 ft, anhydrite shale and dolomite (lower Marine).

NATCHITOCHES PARISH—Jos. E. Popkins' Peavy-Wilson 1, nwc 36-7n-9w, dk.

RED RIVER PARISH—Glassell & Whitehurst's LeLong 1, ne nw ne 25-12n-11w, repr rig, td 1810 ft.

SABINE PARISH—J. C. Sutton Oil Co.'s Sabine Lbr. Co. 1, se nw ne 23-7n-14w, 9⅝ in csg 2132 ft, arr make test 2450 ft chalk (10,000 ft test).

TENSAS PARISH — H. B. Schumacher's Mounds Land Co. 4, 39-11n-12e, lcn.

UNION PARISH — Joe Modisett et al's Frost 1, ne sw 14-21n-1e, elev 188 ft, top Travis Peak 4050 ft 9⅝ in csg 4358 ft, top lower Marine 6161 ft, install heavier rig to deepen to 9100 ft, td 7010 ft.

WEBSTER PARISH — Magnolia's Frank Sexton 1, c sw ne 32-23n-9w, elev 225 ft, 13-3/8 in csg 838 ft, top first anhydrite stringer 4175 ft, top massive anhydrite 4348 ft, top Travis Peak 5701 ft, 7-in csg 6838 ft, dr 7236 ft. Lunsford & Ferguson's Turner 1, 20-20n-8w, arr deepen 1820 ft.

WINN PARISH—G. W. Zeigen's La. Cent. Lbr. Co. 13, 4-13n-1e, woc surf csg 63 ft.

SOUTH LOUISIANA

ACADIA PARISH—Humble's B. Finch 1, S0outh Crowley area, 22-10s-1e, coring shale 8100 ft.

CALCASIEU PARISH — Shell's Calcasieu National Bank 1, Hayes area, 18-11s-5w, coring sand, no shows 8098 ft.

CAMERON PARISH — Humble's Miami Corp. 1-B, Little Cheniere area, 7-14s-6w, dr shale 2198 ft. Superior's State 1, in Gulf of Mexico, 15s-8w, fsh 9394 ft.

IBERIA PARISH—Texas Co.'s Bayless & Jones 1, e flank of Jefferson Island dome, 58-12s-5e, dr water sand 480 ft; some operator's State 4, Fausse Point, 35-11s-8e, coring sand 12s-5e, dr water sand 480 ft; same operator's State 2-B, Vermilion Bay, 16s-5e, dr 5891 ft in sdtr hole.

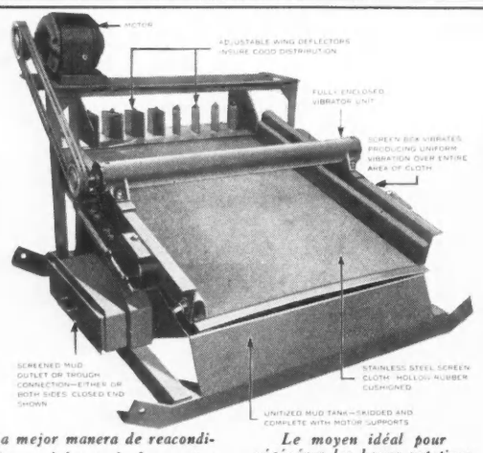
JEFFERSON DAVIS PARISH—Union Sulphur's Calcasieu National Bank 1, Woodlawn area, 12-9s-8w, shut in 8286 ft.

ST. BERNARD PARISH—Gulf's State RR 3, Lake Borgne area, 6-12s-15e, driving piling.

ST. JAMES PARISH—Continental's Realty Operator's 1, Rester prospect, 17-12s-5e, lcn.

ST. MARTIN PARISH—Carter & Stewart et al's Martin 2, Section 28 dome, 32-9s-7e, dr sand no show, 4298 ft. Shell & Tide Water's Unit 1, w Lake Verret prospect, 11-14s-12e, coring sand and shale 8300 ft. Texas Co.'s State 4, Lake Mongouloi area, 14-10s-9e, drilling water sand 7450 ft.

TERREBONNE PARISH—Fohs' Buckley 1, Dulac area, 77-19s-17e, coring shale 2876 ft; same operator's State 1, La Terre area, 41-19s-19e, coring shale 3121 ft.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THE Link-Belt Unitized Vibrating Screen for reconditioning rotary mud includes a screen box, fitted with single piece, rubber-cushioned, stainless steel cloth with tension members; belt drive; mud tank with two-way outlet, made self-contained for supporting screen box and electric motor or steam turbine; distributing chute with control gates and necessary tools. Made in two sizes; namely, 51"x60" and 24"x48"

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The Best Way to Recondition Rotary Mud

Clean mud of uniform consistency and weight can be maintained automatically with the Link-Belt Vibrating Screen. This efficient unit rejects shale and clay cuttings from the mud as it flows over the screen surface on its way to the slush pit, and eliminates a large proportion of fine sand and shale as well. The action of the screen also thoroughly degasses and reconditions the mud for re-use without loss of good mud or a change in its viscosity.

La mejor manera de reacondicionar el barro de la rotativa

Un barro limpio, de uniforme consistencia y peso, puede mantenerse automáticamente con la criba vibratoria Link-Belt. Este eficaz equipo rechaza las partículas de esquisto y arcilla del barro mientras va pasando sobre la superficie de la criba en la dirección del pozo. Quita también una buena proporción de la arena y esquisto fino. La accion de la criba desaloja el gas y reacondiciona muy bien el barro para volverse a usar, sin pérdida de su buena parte o cambio en viscosidad.

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Par l'emploi du Tamis Vibrateur Link-Belt, on peut assurer automatiquement la récupération de boues exemptes d'impuretés, dont la consistance et la densité sont uniformes. Au passage de ces boues à la surface du tamis, sur leur parcours à destination de la fosse à boues liquides, cet appareil efficace en rejette les rognures de glaise et d'argile schisteuse, éliminant du même coup une forte proportion de sable fin et d'argile schisteuse. Le mouvement du tamis a aussi pour effet de dégazer et de régénérer à fond les boues en vue de leur réemploi, et cela sans pertes de bonnes boues ou changement de leur viscosité.

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LINK-BELT VIBRATING SCREEN

MICHIGAN

ALLEGAN COUNTY — Eureka Dev. Co.'s Widenfiller 1, 29-4n-12w, dr 461 ft. Huges Heinig's Lundburg 1, 29-3n-14w, sd for 6-in csg, 1590 ft. S. B. Hood's Wright 1, 9-3n-13w, dr 1600 ft. Fletcher Carscallen's Van Dam 1, 3-4n-14w, sd 1700 ft in Traverse lime, sw. Vague & Nilesen's Vedetta 1, 25-2n-14w, dr 1500 ft.

BARRY COUNTY—Collin & Sope's Simmons 1, 3-4n-10w, driving 10-in csg 210 ft.

BAY COUNTY—C. W. Teater's Goodman 1, 28-18n-3e, dr 1910 ft.

CLARE COUNTY—Gulf & American's Citizens Bank 1, 36-17n-4w, Stray sand 1263 ft, gauged 16 million ft gas at 1278 ft, skidding, to complete as gas well. James McKay's Fee 12, 24-18n-5w, sd 1530 ft. Big Basin Oil Co.'s Murphey 1, 26-17n-3w, driving 10-in csg 581 ft.

GLADWIN COUNTY—W. E. Ross, Trustee's Kinyon 1, 18-18n-2e, drlg Traverse lime 2940 ft, hfw. Rex Oil Co.'s Auer 1, 22-18n-2e, dr 3205 ft. Franklin Pet. Co.'s State 1, 8-19n-2e, dr 419 ft.

ISABELLA COUNTY—Bell & Marks, Inc.'s Fox 1, se sw se 5-13n-5w, rig. J. V. Wicklund Dev. Co.'s Skarritt 3, 5-14n-6w, dr 2900 ft. J. Golden Zabel's Kennedy 1, 25-14n-4w, dr 1790 ft.

KALAMAZOO COUNTY—Premier Oil Co.'s Bourner 1, 3-2s-12w, dr 300 ft; Stevens 1, 21-2s-12w, dr 360 ft.

KENT COUNTY—Barton & Leland's Oudermuluen 1, 29-5n-12w, sd 1990 ft.

LAKE COUNTY—Cherry Valley Oil Co.'s Rice 1, 25-18n-12w, dr 3010 ft, hfw.

MECOSTA COUNTY—Sun Oil Co.'s Robart 1, 29-16n-7w, fsg 3450 ft. Jetter Drlg. Co.'s Deakins 1, 28-13n-7w, dr 310 ft. Frank Hebard's Weeks 1, 32-15n-7w, sd 1100 ft.

MIDLAND COUNTY—Sun Oil Co.'s State B1, 5-16n-1w, testing so 3860 ft; Consumers Power Co. 1, 9-16n-1w, dr 2467 ft; State C-1, nw nw 3-15n-1w, br. Wicklund Dev. Co.'s Land Co. 1, 24-16n-2w, dr 500 ft.

MONTCALM COUNTY—Smith Pet. Co.'s Williams 1, 17-11n-7w, Stray sand 1140 ft, sg, sd 1180 ft. Socony Vacuum Oil Co.'s Hansen 1, 22-12n-6w, sd 1470 ft for 6-in csg. H. L. Gentry Engineering Co.'s Christensen 1, 29-11n-8w, rust 1255 ft.

MUSKEGON COUNTY — W. Michigan's Herman 1, 35-10n-14w, dr 2505 ft.

NEWAYGO COUNTY — Midstate Development Co.'s Eichenberger 1, 7-16n-11w, dr 4460 ft.

OTSEGO COUNTY — Barton & William's Yuill 1, 9-32n-3w, dr 1210 ft.

OTTAWA COUNTY—Morris & Sutherland's Brandt 1, 36-5n-14w, testing so in Traverse, td 1710 ft.

WEXFORD COUNTY—G. H. Schrack's Fee 1, 17-22n-9w, sd 3010 ft.

MISSISSIPPI

CALHOUN COUNTY—S. and O. Properties, Inc.'s G. C. Cooner 1, se ne 12-24n-8e, dr 1735 ft.

CLAIBORNE COUNTY—Claiborne County Dev. Co.'s Ruth Hayden 1, s½ se 55-11n-2e, elev 199 ft, arr deepen, td 1455 ft.

GEORGE COUNTY—Cleve Love et al's J. J. Newman Lbr. Co. 2, c sw 9-1s-8w, sd for bailer and dr pipe, td 105 ft.

HINDS COUNTY—Cleve Love et al's Montgomery 1, sw se se 28-6n-4w, lcn. S. F. Johnson 1, ne se 10-in csg 93 ft, dr 821 ft (Cane River). Black River Oil Co.'s Federal Land Bank 1, ne ne 11-15n-5e, elev 146 ft, top chalk 6961 ft, dr 7106 ft.

JONES COUNTY—Snow-Black Pet. Co.'s Cranford 1, s½ nw 29-7n-12w, sd 4280 ft.

LAMAR COUNTY — Southern Miss. Pet. Corp.'s Morris 1, nw se 4-2n-14w, dr 830 ft. Sun Oil Co. et al's Mrs. Kate Talley 4, se nw 33-4n-15w, elev 374 ft, top salt 8650 ft, dry abn, td 8674 ft salt.

PERRY COUNTY—Phillips Pet. Co.'s J. J. Newman Lbr. Co. 1, se se sw 21-2n-10w, elev 210 ft, dr 6921 ft shale.

SIMPSON COUNTY—Goodwill O&G Co.'s Berry 1, se sw 33-2n-4e, dr 1590 ft latest report.

YALABOUSHA COUNTY — Acme Holding Co.'s S. D. Boyle 1, nw nw 33-25s-7e, elev 285 ft, sd 810 ft (Midway).

OKLAHOMA

ADAIR COUNTY—Maddox's Penn Mutual Life Ins. Co. cs/2 ne nw 5-16n-24e, dr 260 ft.

ATOKA COUNTY—Sheldon & Gardner Pet Co.'s Lee 1, ne nw sw 2-4s-10e, dr 3035 ft. Stanolind & Amerada's Ridgway 1, nw ne ne 24-3s-9e, dr 1950 ft. Turner's Collins 1-A, sw ne ne 18-4s-10e, sd 895 ft.

BECKHAM COUNTY—Mid-American's Biscoe 1-A, sw sw sw 28-8n-22w, co 2631 ft.

BRYAN COUNTY—Southern's Henry 1, cnw ne 10-8s-7e, dr 3182 ft.

CADDO COUNTY—I.T.I.O. Co.'s Dome-Bo 1, cne se 29-6n-10w, td 6900 ft; sdo.

CARTER COUNTY—Lloyd & Noble's Revelle 1, sw sw se 21-3s-2w, td 4028 ft; sdo.

CLEVELAND COUNTY—Harper & Tur-

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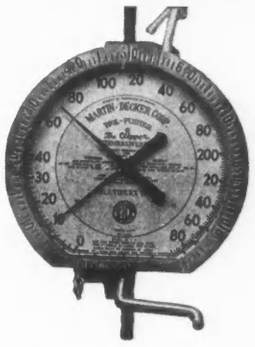

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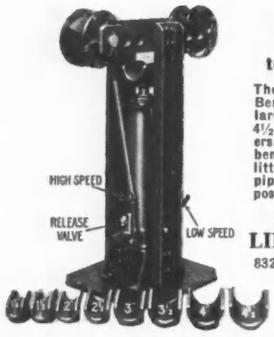

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CHOCTAW COUNTY—Chapman & Lowe's Hallum 1, nw nw ne 4-7s-20e, dr 675 ft. True's Boby 1, nw se nw nw 17-7s-19e, td 2044 ft; sdo.

COMANCHE COUNTY—Wolf's Costinus 1, sw sw se 30-4n-11w, spd. Scott's Kuntz 1-A, se ne se 27-4n-11w, sd 2800 ft. Roach's Green 1-A, se se sw 2-1n-13w, dr 550 ft.

COTTON COUNTY—Bowers & Wise's Pendergraft 1, nw se sw 4-4s-12w, spd & abd. W & P Oil's Worsham 1, nw nw se 15-4s-10w, lcn.

CREEK COUNTY—Mosier's Holcomb 1, se sw ne 19-18n-8e, td 3018 ft; 2000 ft wih & SSO; sd.

GARFIELD COUNTY—Hollenback's Clark 1-A, nw nw nw 34-21n-6w, td 7336 ft; perf. & SSG & 800 ft mud, 45 min.

GARVIN COUNTY—Edwards' Clark 1, ne ne ne 16-3n-3e, td 2676 ft; rust.

GRADY COUNTY—Gulf's Thomas 1, sw nw nw 14-4n-5w, dr 10,352 ft. Doyle's Huffine 1, nw nw se 30-5n-8w, der. Nicholson's Cleveland 1, nw ne ne 18-5n-8w, pits.

GRANT COUNTY—Magnolia's Reynolds 1, ne ne se 19-25n-5w, td 6236 ft, abd.

GREER COUNTY—Medlin's Broudie 1, nw nw nw 5-6n-20w, sd 90 ft. McDonald's Fite 1, se se nw 34-7n-21w, dr 886 ft. Gauntt & Baker's Parks 1, nw nw sw 29-7n-20w, sd 720 ft. Everitt's Graumann 1, ne nw nw 11-5n-21w, C & P.

HUGHES COUNTY—Phillips Pet.'s Becker 1, ne nw sw 8-5n-10e, dr 6282 ft. Doup's Bank 1, ne ne nw 7-7n-9e, fsg 335 ft.

JEFFERSON COUNTY—Massad & Swainsberger's Barrett 1, ne se se 14-6s-6w, sd 1890 ft. Weir's Hayes 1, se se nw 23-7s-7w, der.

JOHNSTON COUNTY—Patton's McCrumments 1, sw sw ne 16-1s-6e, sd 1380 ft. Shelton's Chapman 1, cnw nw 26-4s-6e, dr 2925 ft.

KAY COUNTY—Shaffer's McKee 1, ne ne nw 20-28n-1w, sd 2500 ft. Shaffer's Rudolph 1, ne ne sw 27-29n-1w, cel. Nye's Willin 1, se se sw 24-27n-4e, C & P.

KIOWA COUNTY—Hughes & Reese's Fultz 1, se se se 10-6n-18w, sd 1238 ft.

LINCOLN COUNTY—Wilcox's Royer 1, se se ne 18-14n-6e, rig.

LOGAN COUNTY—The Texas Co.'s Roper 1, cw/2 sw se 22-15n-1e, td 5542 ft; sdo. Arrow Drlg's Dobson 1, nw nw nw 23-17n-1w, dr 4140 ft. Carter's Lydick 1, ce/2 nw ne 23-15n-4w C & P. Helmerich & Payne's Ritchie 1, cne nw 34-18n-1e, dr 2095 ft.

LOVE COUNTY—Sinclair Prairie's Peabody 1, ne ne ne 35-6s-2w, spd 80 ft.

MURRAY COUNTY—Owens' Gryer 1, ne se ne 34-1s-3e, dr 2685 ft.

MUSKOGEE COUNTY—Cusack's Elliott 1, cnl nw sw 20-15n-20e, rog. Cusack's Fee 1, ne sw se 20-15n-20e, spd 65 ft.

OKFUSKEE COUNTY—Mid-Continent's Irelan 1, sw ne sw 10-13n-10e, td 3431 ft; swb 125 bbls oil 24 hrs; Comp. Broswood Oil's Lehman 1, nw sw nw 21-13n-10e, td 2854 ft; est 60 bbls oil per day; wo tanks.

OKLAHOMA COUNTY—Allen's Weaver 1, ce/2 se nw 6-14n-3w, dr 5692 ft.

OKMULGEE COUNTY — Phillips Pet.'s Wood's 1, nw sw sw 31-11n-13e, dr 3650 ft. Detrick's McCann 1, nw se sw 33-14n-11e, dr 950 ft.

OSAGE COUNTY—Norbla-Carter's Mullendore Trust Co. 1, nw nw nw 3-24n-6e, spd. Norbla's Osage 1, se se se 18-25n-7e, lcn.

PAWNEE COUNTY—Ross & Patterson's Morhain Heirs 1, ne ne nw 30-22n-7e, rig.

PAYNE COUNTY—Sagamore's Moore 1, se sw nw 17-18n-1e, rig.

PONTOTOC COUNTY—Union Dev. Co.'s Abbott 1, sw nw ne 34-3n-6e, fsg 3320 ft. Lee's Weatherly 1, nw se nw 24-1n-7e, set 12½-in csg 243 ft. Riddle's Fee 1, nw sw se 11 3n-5e, dr 4485 ft.

ROGER MILLS COUNTY—Central Pet.'s Lambe 1, se se se 27-14n-21w, rig corners & sd.

SEMINOLE COUNTY—Woodson & Marydun Oil's Gilliland 1, se se sw 24-11n-7e, td 4295 ft; bailing.

STEPHENS COUNTY—Coline's Johnson 1, sw se ne 1-2n-8w, td 9086 ft; bailing. Helmerich & Payne's Pfile 1, sw sw sw 1-2s-7w, td 4246 ft; cem btm of hole & move out tools. Parson's Mouersberger 1, cs/2 sw se 29-2n-8w, der.

TEXAS COUNTY—Hagey's Peck 1, cne/4 6-1n-13e cm, td 2842 ft; dr plug.

TILLMAN COUNTY—Cockburn's Nicholas 1, se se se 28-2s-19w, co 2500 ft. Gibson-Jennings' Burleson 1, se se sw 35-2s-19w, lcn. Schoonover's Loftis 1, nw nw se 19-2s-18w, lcn. I.T.I.O. Co.'s Drumm 1, cn/2 sw nw 32-2s-17w, sdo 3843 ft. Martin's Parris 1, nw nw sw 3-3s-19w, fsg 2135 ft. Grimes' Laney 1, nw nw nw 3-3s-18w, dr 800 ft. Grimes' Hall 1, sw ne sw 12-3s-19w, lcn.

WASHITA COUNTY—McWhirter's Fee 1, nw sw sw 34-8n-19w, co 2020 ft.

WEST TEXAS

(This report confined to south and east portion of the Permian basin and all Ordovician and Deleware projects.)

BREWSTER COUNTY—Floyd C. Dodson-B. A. Duffey et al's Texas American Synd. 1-A, near ce ne ne GH&SA Ry sec 66, blk 10, elev 4228 ft, top Delaware shale 2297 ft, top Simpson 6733 ft, dr 7165 ft. G. H. Storey et al's J. P. Wilson 1, c se nw of T&St L Ry sec 3, blk 212, elev 3609 ft, sd 2545 ft. H. D. Wilcox et al's H. L. Kokernot 1, nw sw sec 12, blk C, J. V. Massey sur, sp & sd.

CRANE COUNTY—W. N. Waddell et al 7, c sw se PSL sec 4, blk B-27, Ordovician test, elev 2537 ft, dr 4690 ft. Loffland Bros. Co.'s Reidland 1, SEc of PSL sec 2, blk B-27, Ordovician test, elev 2570 ft, lost dp 5434 ft, cem whipstock 5170-96 ft, dr by junk. Magnolia's University 1-16, NWc sec 16, blk 30, mim.

CONCHO COUNTY—Barnett Oil Developments, Inc.'s Sims 1, Carl Thiele sur No. 58, 3 mi nw Paint Rock, 4000-ft Ordovician test, elev 1674 ft, sd 110 ft.

COKE COUNTY—Barnett Pet. Corp.'s J. E. Mims 1, SEc T&P Ry sec 39, blk W, elev 2352 ft, show oil 1640 ft, sd 1680 ft. H. E. Ogden et al's E. C. Rawlings 1, swc H&TC Ry sec 391, blk 1-A, sul w 2240 ft, run cas 2285 ft.

CROCKETT COUNTY—Moore Bros. Corp.'s Paul Perner 1, c nw¼ I&GN Ry sec 37, blk 2, elev 2560 ft, top lime 1600 ft, dr and abd in brown sandy-lime 9105 ft. H. A. Ringle et al's A. C. Hoover 2, sw se nw GC&SF Ry sec 14, blk 1, elev 2368 ft, top lime 1985 ft, sul w 2100-22 ft, dry and abd. Rockmaker et al's A. C. Hoover 1, nec sw¼ B&B sec 1, blk FF, lcn. Short & Gillette's A. C. Hoover 1, se se nw GC&SF sec 3, blk 1 mim. Sindorf & Stone's A. C. Hoover 1, nwc GC&SF sec 4 (south), machine. Stewart & Cormas' A. C. Hoover 1, nw sw of B&B Ry sec 1, blk FF, elev 2380 ft, top salt 475 ft, top lime 1747 ft, dr on bridge, td 1931 ft.

CULBERSON COUNTY—Ross Brewer, Collins et al's C. M. Caldwell 1, sw¼ of PSL sec 14, blk 42, Delaware test, elev 3819 ft, top black lime 1880 ft, dr 2155 ft. Jarrell, Earl Bell & Harrison's C. M. Caldwell 1, c sw of PSL sec 15, blk 109, Delaware test, sd 131 ft.

JEFF DAVIS COUNTY—H. F. Wilcox O&G Co.'s Jones-Coffield 1, nec of H&TC Ry sec 121, blk 4, sd 3500 ft.

ECTOR COUNTY—J. D. Bodkins et al's W. P. Edwards 1, sw sw se T&P Ry sec 37, blk 43, T-3-S, elev 2953 ft, top anhydrite 1842 ft, top salt 1860 ft, dry and abd 4901 ft.

EL PASO COUNTY—Tri-State Oil Co.'s Chas. & L. M. Kinkel 1, ne ne ne sec 237 S.F. No. 7232, elev 3977 ft, dr 3570 ft.

FISHER COUNTY—Bond Oil Corp.'s Bertram 1, sec sw¼ labor 43, league 323, Bastrop C.S.L. sur, elev 1852 ft, base Sedwick 2764 ft, top Dothan 2800 ft, top Noodle Creek lime 2900 ft, tested small show o&g lime 3181-84 ft, dr 3185 ft. Owens-Snebold Oil Corp.-A. C. Verner's J. H. Milsap 1, swc w½ ne H&TC sec 61, blk 1, lcn.

TOM GREEN COUNTY—Humble's Lewis-Wardlaw 1, near c ne se H&TC Ry sec 5, blk 17, Ordovician test, elev 2142 ft, San Angelo lime 340 to 630 ft, dr 5805 ft. Southern Cross Oil Co.'s J. W. Wilson 1, c nw AB&M sec 30, blk A, lcn. M. R. Stuard et al's Frank Garlitz 1, J. H. Mueller sur No. 2201, Certf. No. 760, dd fr 630 ft.

GLASSCOCK COUNTY—O. B. Greathouse et al's Burns 1, sw¼ of W&NW Ry sec 211, blk 29, lcn.

HOWARD COUNTY—H. L. Lockhart et al's Scott 1, sec of W&NW Ry sec 67, blk 29, elev 2415 ft, show o&g, dr 2890 ft. Roy A. Westbrook et al's Great West Ref. Co. 1, near nec of T&P Ry sec 48, blk 32, T-1-N, elev 2469 ft, gauged 368,000,000 ft of nitrogen and oxygen at 1460 ft, prod declined and cased off, dr 3405 ft.

HUDSPETH COUNTY—Haymon Krupp Oil & Land Co.'s K. S. Briggs 1, nwc T&P Ry sec 24, blk 73, Tsp 7, ur 2760 ft; S. J. Thaxton 1, near sec ne se T&P Ry sec 34, blk 74, Tsp 6, dr 3780 ft.

LOVING COUNTY—Shell's T. P. Land Trust 1, sw sw se T&P sec 17, blk 55, Tsp 1, mim. Argo Oil Corp.'s T. P. Land Trust 1, se se sw T&P sec 17, blk 55, Tsp. 1, lcn. Michigan O&G Co.'s M. Kyle 5, nw nw ne T&P Ry sec 20, blk 55, Tsp. 1, top Delaware lime 3880 ft, top sand 3912 ft, shot 100 qts, 3912-65 ft, testing.

MENARD COUNTY—G. A. Clements et al's A. H. Murchison 1, swc of sec 80, elev 2073 ft, dr 855 ft. C. D. Hagerty et al's Callan 1, swc of e½ of J. M. Franz sur, sec 36, elev 2026 ft, sd 199 ft.

MITCHELL COUNTY—Standard Oil Co. (Texas)'s W. L. Foster 1, lse 6, nw se nw T&P Ry sec 44, blk 29, T-1-N, elev 2239 ft, show o&g, dr 2915 ft.

NOLAN COUNTY — Marland-Drake Drl. Co.'s E. H. Withers 1, c sw¼ T&P Ry sec 65, blk 21, mim.

PECOS COUNTY—Aero Gas & Ref. Co.'s Iowa Realty Trust 1, e cor H&TC sec 13, blk 10, sp; Johnson-Skelly 1-a, n½ of H&GN sec 40, blk 8, elev 2446 ft, top lime 2150 ft, dr 2670 ft. Harry Baker et al's White-Baker 1, nec of GC&SF Ry sec 53, blk 194, elev 2519 ft, dry and abd in sul w 1939 ft. J. J. Dorr et al's Payton 2, nw part of H&GN Ry sec 99, blk 8, elev 2440 ft, dr 1910 ft. Cardinal Oil Co.'s White-Baker 1-36, se se sw T. C. Ry sec 36, blk Z, mim. Ed. Falvey et al's Joe C. Trees 1, sw nw nw H&GN Ry sec 63, blk 8, bailing 2055 ft. D. W. Francis et al's Westerman-Haggen 1-A, nwc of 186-ac lse, Rubian Phares sur, blk 166, elev 3155 ft, top lime 2633 ft, gas pay 2820-2978 ft, completed 9,000,000 ft sweet gas open flow. Magnolia Pet. Co. et al's J. H. McKee 1-a, near nw nw sw H&GN Ry sec 24, blk 9, elev 2385 ft (jkd twice), top Simpson 4775 ft, sandy-lime pay 5280-89 ft, shale 5289-94 ft, tested small amount o&g, dd to 5330 ft, run 7-in pipe. H. H. Sides et al's Blackstone-Slaughter 1, sec T&StL sec 25, blk 130, lcn. Thompson & E. R. Minshall's Michaelson 1, c nw nw of T&StL Ry sec 24, blk 146, elev 3023 ft, sd in sul w 3303-04 ft. Stanley A. Thompson et al's Elsinore Cattle Co. 1, se¼ of GC&SF Ry sec 53, blk 4, Ordovician test, elev 3938 ft, cem 5½-in 7028 ft, tested dry 7128 ft. Trans-Pecos Oil Co.'s F. M. Gallaher 1, ne ne nw T&P Ry sec 9, blk 51, Tsp. 10, sd 1620 ft; Popham Land & Cattle Co. 1-B, s½ of GH&SA Ry sec 235, blk 11 (rd hole), sd 1540 ft. H. F. Wilcox O&G Co.'s Cerf 1, near c ne sw of T&StL Ry. sec 27, blk 130, dr 1570 ft.

PRESIDIO COUNTY—Brite Production Co.'s L. C. Brite 1, ne¼ of GH&SA Ry sec 113, blk 12, tested 2½ bbls oil daily at 4267-75 ft, lost hole, dr new hole 4005 ft.

REEVES COUNTY—Barnett Pet. Corp.-J. C. Hill & Conoco's Ely-Healy 1, c nw¼ of PSL sec 38, blk 71, Delaware test, elev 3166 ft, dr 3990 ft. Grisham-Hunter Corp.'s T. P. Land Trust 1, ne¼ T&P Ry sec 40, blk 58, Tsp. 6, lcn. C. R. Mallison-Sid W. Richardson et al's Eliza M. Brown 1, near c sw¼ of H&GN Ry sec 62, blk 4, elev 2686 ft, dr gray lime 4210 ft. Ohio Oil Co.'s Popham Land & Cattle Co. 1, nw¼ of T&P Ry sec 18, blk 54, Tsp 10, dr 855 ft.

RUNNELS COUNTY—F. G. Beaudoin & Rex Cannon's H. Geisecke 1, Jas. Hughes sur, A-227, lcn. Homer Price & A. E. Koener's J. C. Beddo 1, sud-div No. 51, D. Diaz sur, elev 1700 ft, sd 3483 ft. J. W. McLean et al's Pflueger 1, Asa Clark sur, A-506, lcn.

SCHLEICHER COUNTY—John M. Cooper et al's Bert Page 2, c ne se GH&SA Ry sec 40, blk L, elev 2289 ft, Ordovician test, sd 5004 ft. H. B. Opp et al's J. T. Jackson 1, nw ne T. C. Ry sec 41, blk LL, sp and sd. Tex-Tor Oil Corp.'s Judkins-Spencer 1, c sw¼ of A.&B. Ry sec 33, blk A, elev 2235 ft, Ordovician test, top Ellenberger 5547 ft, no shows, sd 6210 ft.

SCURRY COUNTY—Robinson Drl. Co.'s A. C. Martin 1, c nw sw H&TC Ry sec 147, blk 97, elev 2234 ft, top lime 1514 ft, pb fr 3515 to 2590 ft, shot 300 qts 2420-92 ft, pb to 2500 ft, used 1000 gals acid, lost cas seat. T. G. Shaw Oil Corp.'s First Nat'l Bank (Ft. Worth) 1, c nw¼ H&TC Ry sec 112, blk 97, elev 2214 ft, top lime 1568 ft, sd 3369 ft.

STONEWALL COUNTY—Gen'l Crude Oil Co.'s J. D. Smith 1, sec of H&TC Ry sec 371, blk 2, 13 mi n Rotan, dr 1980 ft. A. G. Swanson & Parriott's H. T. Carlisle 1, sw se sw H&TC sec 293, blk D, mim.

SUTTON COUNTY—Ordovician Oil Co.'s J. T. Evans 1, nec sec 1, blk V-26, Lucy Stubblefield sur, elev 2126 ft, top Canyon, trace o&g, 2320 ft, top Strawn with oil odor in water 2860 ft, top Bend lime 3198 or 3315 ft, top Ellenberger 4085 ft, no shows, dr 4130 ft. A. A. Basse, S. J. Sackett & J. W. Sorrell's W. A. Miers 1, cnw¼ sec 54, TW&NG sur, blk 14, sp and sd.

STERLING COUNTY—John W. Sward et al's T. G. Brennand 1, se se ne H&TC sec 107, blk 2, sd 170 ft.

TAYLOR COUNTY—Dr. W. C. Bramham et al's Ernest Armstrong 1, swc ne se sec 40, Blind Asylum Lands, lcn. E. P. Campbell et al's J. McGee-H. James 1, ne ne sw T&P sec 22, blk 16, lcn. E. G. Mahan et al's Mrs. Edna Alexander 1, sec se sec 22, Blind Asylum Lands, lcn.

TERRELL COUNTY—R. A. Basurto et al's J. H. Phelps-Bates 1, near sec nw¼ sec 5, G. W. Turley sur, A-4, Ordovician test, elev 2185 ft, sd 5600 ft. D. & S. Oil Co.'s Sam Bell 1, near swc ne sw of EL&RR sec 68, blk D-7, dr 510 ft.

UPTON COUNTY—L. H. Choate & F. T. Hogan's S. E. Carter 1, e¼ of H&TC Ry sec 210, blk 6, top anhydrite 295 ft, salt 495-1080 ft, top lime 1935 ft, dry & abd in sul w 2195

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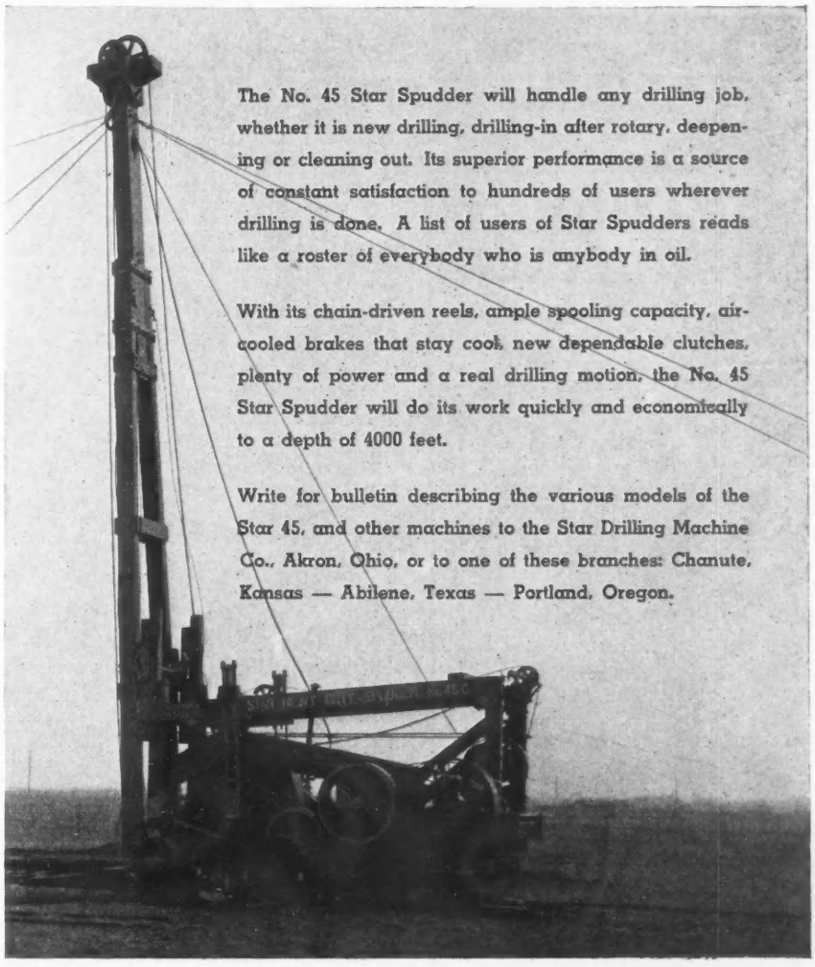

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ft. W. D. Riser et al's King 1, nwc n½ MK&T Ry sec 8, blk 3, fsh 730 ft.

WARD COUNTY—States Oil Corp. (was Bahan, Rhodes & Tompkins') H. A. Spencer 1, e cor of H&TC Ry sec 41, blk 34, elev 2610 ft, jkd 660 ft, skid rotary. L. B. Hoss & F. J. Downey's R. Avery-Atlantic 1, s¼ H&TC Ry sec 36, blk 1, elev 2407 ft, dr 1060 ft; Viola Meyers 1, sw 80-ac of H&TC Ry sec 17, blk 32, sp and sd. Magnolia Pet. Co.'s Geo. Sealy 2-46, ne sw ne of G&MMB&A sec 46, blk F, elev 2713 ft, top anhydrite 1595 ft, Rustler 1725-45 ft, top lime 2658 ft, td 3040 ft, flowed 125 bbls natural for completion. R. G. Patillo et al's Blair-Republic 1, n cor of H&TC Ry sec 5, blk 32, dr 1545 ft. Schkade & Patillo's Dorr 1, near sec H&TC Ry sec 35, blk 1, elev 2405 ft, missed pay, dry and abd 2015 ft. Frank T. Pickrell, Jean E. FitzPatrick, Dodson et al's H. B. Carr 1, c w¼ of n¼ of H&TC Ry sec 125, blk 34, Delaware test, dk; F. I. Dyer 1, w¼ of n¼ of H&TC Ry sec 135, blk 34, Delaware test, sd for cas 1000 ft.

EAST TEXAS

BOWIE COUNTY—King Oil Corp.'s W. W. Ames 1, J. A. Talbott sur, 4½ mi nw Texarkana, elev 362 ft, base anhydrite 3990 ft, coring

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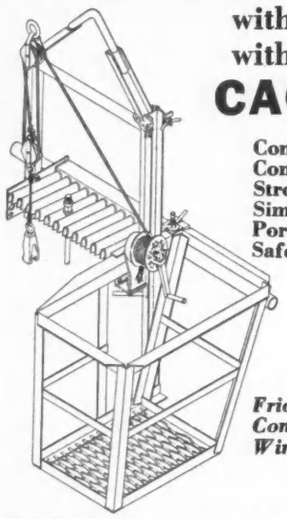

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4365 ft; Nanny Watts 1 (12-ac), G. Brinbee sur, 4 mi w Texarkana, elev 374 ft, dr 560 ft.

CHEROKEE COUNTY—Bunn Drlg. Co.-John G. Mayo et al's J. H. Bowling 1, W. H. Walters sur, 2 mi se Lone Star, dr 1720 ft. Gray & Wolfe's M. Dupree-Shell 1 (131-ac), Levi Jordan sur, Rusk pool, elev 334 ft, Pecan chalk 3940-4340 ft, Austin chalk 4839-5068 ft, top Woodbine 5072-5170 ft, dry and abd. Lide, Greer and American Liberty Oil Co.'s S. L. Tankersley 1 (40-ac), Jose Pineda sur, Ironton, rur. Merica Oil Co.-W. L. Stone's Cherokee Dev. Co. 1, A. J. Acker sur, 2 mi e Maydelle, elev 661 ft, top Pecan chalk 4160 ft, dr 4805 ft.

DALLAS COUNTY—Mauldin Oil Co.'s W. E. Howell 1 (107-ac), S. Layton sur, 8 mi e Grapevine, sd 1010 ft. Plaza Oil Co.-W. A. Brooks, Jr.'s B. J. Davidson 1 (75-ac), John D. Merchant sur, sd 347 ft.

DELTA COUNTY—O. W. Killam et al's Delta Farming Assn. 1, J. Dollahite sur, 4 mi ne Sulphur Bluff, elev 348 ft, top Woodbine 2712 ft, sd 2920 ft.

FRANKLIN COUNTY—Ajo Oil Corp., et al (was Chenault's) T. J. Sanders 1 (4-ac), C. Payne sur, Talco sub-Trinity test, elev 365 ft, Pecan chalk 1602-1920 ft, top Woodbine red beds 3635 ft, top Georgetown lime 4012 ft, rur to dd fr 4374 ft. L. S. Harper et al's fee 2, W. N. Dawson sur, 7½ mi nw Mt. Vernon, elev 377 ft, mim.

GREGG COUNTY—Humble & Gulf's E. D. Robertson 1 ((11.4-ac), M. Mann sur, 2½ mi w by s Longview, 4 mi e production, elev 272 ft, Austin chalk 3202-3341 ft, top Georgetown 3341 ft, top Paluxy 4541 ft, first Glen Rose 4876 ft, top anhydrite stringer 5617 ft, massive anhydrite 6214-6532 ft, top Travis Peak 7325 ft, dr 8490 ft.

HENDERSON COUNTY—E. B. LaRue et al's Breedlove-Mills 1 (232½-ac), J. Dunn sur, 5 mi nw LaRue, elev 485 ft, Pecan chalk 1906-1970 ft, Austin chalk 2635-2960 ft, top Woodbine 3004 ft, sd 3075 ft. DeArman, McMillan & Hunt's J. M. Dawdy 1, Geo. Hancock sur No. 7, Flag Lake area, top Pecan chalk 1730 ft, top Gober chalk 2517 ft, dr 2910 ft. Harry Hines, Hancock et al's A. R. Dillard 1, Henry Jeffrey sur, Flag Lake area, dr 1800 ft.

HOUSTON COUNTY—Humble O&R Co.-Sun Oil Co.'s H. H. Dailey 1 (1000-ac), J. L. Reviere sur, 3½ mi se Navarro Crossing, rur. Peyton Bros. et al's J. P. Daniels 1 (100-ac), Juan M. Procella sur No. 70, ½ mi n Percilla, cem sur pipe.

LAMAR COUNTY—Cooper Bros. et al's L. B. Hayes 1, Luke Roberts sur, 1½ mi w Deport, elev 410 ft, sd 275 ft.

LEON COUNTY—Lone Star Gas Co.'s Sara Melasky 1 (81.98-ac), M. C. Lee sur No. 500, Buffalo area, top Pecan chalk 3989 ft, dr 4200 ft.

LIMESTONE COUNTY—J. S. Cosden, Jr. et al's J. J. Bower 1 (15-ac), J. Breeding sur, near Prairie Hill, cem sur pipe. Stanolind & Ramsey Pet. Corp.'s T. Norris 1 (40-ac), K. Thrasher sur, 5 mi n Kosse and on Thornton fault, elev 528 ft, Austin chalk 2791-2890 ft, top Woodbine 2980 ft, top Georgetown 3255 ft, first Glen Rose 4026 ft, top first anhydrite 4886 ft, top Pettit 5375 ft, top Travis Peak 5528 ft, top lower Marine 7595 ft, top Marine lime 8525 ft, sd 8741 ft to cem 7-in pipe 8740 ft.

NAVARRO COUNTY—Natural Pet. Co.'s Karen Brown 1 (309-ac), W. T. Turner sur, 2 mi e Roane, elev 433 ft, dr 525 ft. L. B. Orchard & A. G. W. Biddle's Guy M. Gibson 1, Isaac Bird sur No. 80, 6 mi sw Rural Shade, elev 328 ft, dr 2910 ft. Mrs. Jane Robinson et al's Fortson 1, Eli Smith sur, 5 mi ne Corsicana, elev 345 ft, Austin chalk 1346-1585 ft, top Woodbine 2185 ft, dr 2245 ft.

SMITH COUNTY—John G. Mayo, Housh & Thompson, Inc.'s J. B. Mayfield 1 (130-ac), Wm. Keys sur, 4 mi se Tyler, rig.

UPSHUR COUNTY—Tom Hunter-American Liberty Oil Co. et al's Dr. Chas. Carter 1, (80-ac), J. H. Fields sur, 1½ mi n Kelsey, elev 428 ft, Pecan chalk 2250-2690 ft, Austin chalk 3295-3332 ft, top Red Beds 5085 ft, top Paluxy 5590 ft, top anhydrite stringer 5978 ft, massive anhydrite 6520-6756 ft, basal anhydrite 6786-6807 ft, tested 1000 ft w 6991-7111 ft, dr 7345 ft.

EAST TEXAS BORDER COUNTIES

CASS COUNTY—V. A. Hughes & Co.'s Lyster 1, Wm. Bateman sur, top Georgetown lime 4215 ft, sd 4670 ft. G. H. Vaughn's Ryley 1, Taylor sur, dr 4850 ft. C. H. Chambless' White & Walker Lbr Co. 1, J. J. Potter sur (280-ac), sp dr 1700 ft.

HARRISON COUNTY—Ark. Fuel Oil Co.'s C. M. Abney 1, Eason Little sur, drilling out bridges, after killing well, arr deepen td 4820 ft.

PANOLA COUNTY—Preston et al's Rushing 1, Mannan Smith sur, owdd, td 2950 ft. Texas Co.'s Claude Adams 1, Thos. Cox sur, 13⅜-in csg 579 ft, dr 4020 ft, lime and shale.

SHELBY COUNTY—Joe Burnham et al's George 1, C. C. Tutt sur, owdd, td 2950 ft.

SOUTH TEXAS

BEE COUNTY—Dougherty's Beck 1, blk 9, Uranga gr, lcn.

HIDALGO COUNTY—Gulf State's Cardenas 1, Tule gr, lcn. Johnson's Daskam 1, por 45, sp.

JACKSON COUNTY — Adams' Foust 1, White sur, dk. Magnolia's West 1, Musquiz sur, dr sh and shells 6285 ft.

JIM WELLS COUNTY—Howell's Goldapp 1, Welhausen subd., wocs 3634 ft. Magnolia's Seeligson 8, Los Jaboncillos gr, dr 4970 ft. Presnall & Mosser's Mortgage 1, La Vaca gr, mim.

KARNES COUNTY—Randon's Radford 1, Martinez sur, dr 2910 ft.

LIVE OAK COUNTY — Chew & Hantho-Nelson's Bell 1, Parks sur, testing 5076 ft. Franklin's Russell 1, sp and sd, wo wtr. Hannah's Wedding 1, dr below 2600 ft. H. and H.'s Nichols 1-A, dr 400 ft. Hickok & Reynolds' Land Bank 1, Henry sur, dr below 1200 ft. Holland's Alamo 2, Ginemez sur, dr below 1000 ft. Newton's West 1, Pieratt sur, ru. Richardson & Karotkin's Poppe 1, sec 148, sp.

NUECES COUNTY — Andrade's Dunn 1, Hinojosa sur 422, dr below 2850 ft. Camp's Wardner 4, sec 16, dr 6150 ft. Coastline's State 1, tr 230, driving piling. Corpus Christi's Howington 1, sur 156, dk. Morgan's Fee 1, lot 45, mim. Renwar's Morgan 1, sur 413, dr below 5550 ft. Richardson's Cowles 1, sec 43, dr below 5304 ft. Rutherford's Stewart 1, sur 418, drilling deeper below 6215 ft. Temple's Singer 1, sur 421, coring below 5705 ft. Texon's Horne 1, Palo Alto gr, dr below 4150 ft. Union's Brown 1, sec 87, dr 1780 ft; Galladay 1, Garcia gr, cor 7745 ft; Rivers 4-A, dr 5700 ft.

REFUGIO COUNTY—Barnsdall & Transwestern's Fagan 1, Fagan sur, tentative lcn. Continental's Scott 1, Reojas sur, dr 5150 ft. Hogan's Kelly 1, Power sur, dr 4440 ft. T-N's Lambert 1, Refugio gr, dr below 5480 ft.

SAN PATRICIO COUNTY—Bob's Green 2, Williamson sur, cor 6714 ft. Cain's Guy 1, sec 70, dr 4700 ft. Humble's Smith & Talbert 1, sec 37, lcn. Moore's Kelly 1, lot 24, dr 4375 ft. Plymouth's Brigham 1, sec 62, wocs, depth 5665 ft.

VICTORIA COUNTY—Edwards' Robertson 1, Burnham sur, cor below 5130 ft. Portilla's Welder D-1, sur 3, mi dk. Stanolind's Vandenberge 1, Benavides sur, dr 4600 ft. Superior & Gillespie's Mahon & Buehler 1, S. A. Valley Ditch Co. sur, wocs 850 ft.

WILLACY COUNTY — Magnolia's Armendiaz 1, Carricitos grant, dr 9191 ft. Sal Vieja's Garcia 2, Carricitos gr, wocs 1398 ft.

LAREDO DISTRICT

DUVAL COUNTY—Argo's Bolte 1, sec 18, dr wtr well. Carter-Rubsamen's Peters 1, sur 66, cor below 2491 ft. Conroe's Trevino 1, lot 16, lcn. Cowan & Sorey's Taylor 1, sec 214, dr below 1471 ft. Culton's Sutherland 1, sec 188, dr 500 ft. Dovre's Hagist 1, sec 265, fsg 1745 ft. Magnolia's DCRC 1, sur 196, cor below 1650 ft. Southwood's Nolen 1, on line between surs 104 and 106, dr below 6200 ft.

JIM HOGG COUNTY—Stephens' Gruy 1, blk 13, dr below 3200 ft.

McMULLEN COUNTY—Day's Wulff 1, sec 77, dk. Magnolia's Edrington 1, sur 85, cor 2435 ft.

STARR COUNTY—Collins' Guerra 1, sh 20, dr below 5440 ft. Sun's Guerra D-2, dk. Transwestern's Slick 1, sur 266, si for gauge, depth 6862 ft.

WEBB COUNTY—Boysen & Jones' Watkins 1, sec 20, dr below 4190 ft. Colton-Lester-Mitchell's Lopez 1, sur 55, completing, depth 2680 ft. Davidson's Aguilar 1, sur 472, mim. Gilcrease's Trafton 1, sur 282, dr below 1600 ft. Hill's Adami 1, sur 345, lcn. Moore & Meaders' Garcia & Villareal 1, coring for sand.

ZAPATA COUNTY—Falcon's Yzaguirre 1, por 14, mim. Killam's Rodriguez 1, sh 12, cor below 1005 ft. Tomkins' Gutierrez 1, India gr, sd 50 ft.

PETROLEUM DICTIONARY

***By* HOLLIS P. PORTER**

Member of American Society of Mechanical Engineers, American Petroleum Institute.

This work grew out of a demand for some source of definition for the terms used by the petroleum industry. It contains over 3,000 definitions of words used constantly by all phases of the petroleum industry. It was published in 1936 and has found its way into engineering departments, legal departments and land departments of producing concerns, as well as to the desks of executives of the petroleum industry.

Manufacturers also find it valuable for reference. Advertising agencies find it a valuable addition to the library.

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SAN ANTONIO DISTRICT

BASTROP COUNTY—Bibb's Lentz 1, sd 2540 ft.

BEXAR COUNTY—Fair's Hatch 1, blk 52, completing around 1550 ft. Hamill & Hamill's Brietzke 1, Rodriguez sur, dr below 600 ft. Harrison, Fain & Smith's Schuwirth 1, Garza gr, dk. Hickok & Reynolds' Ewert 1, York sur, dr below 1560 ft. Parsynsen's Fee 1, Lindsay sur, dr 1380 ft. Philtop's Cassin 1, dr below 380 ft. Rodenburg's Carle 1, Rolen sur, dr 410 ft.

BURLESON COUNTY—Red Bank's Coffield 1, Santef sur, lcn.

CALDWELL COUNTY—Brady & Pummel's Jackson 1, Morris sur, ru pump, depth 2680 ft. Brown's Blackwell 1, Roe sur, plugging back from 2347 ft. Mac-Wag-Tree's Roberts 1, House sur, tested sul wtr, may dd from 2633 ft. Owens & Van Wagnen's Smith 1, Roe sur, dr below 2002 ft.

DIMMITT COUNTY—Teas & Maryland's McKnight 1, sec 23, ran electrical logging device at 7050 ft.

EDWARDS COUNTY—Auld's Henderson 1, sec 46, td 3185 ft, bldg new roads. Evans & Love's Brown 1, sec 66, sh at 5845 ft shale.

FRIO COUNTY—Pagenkopf & Jamieson's Houston 1, sur 151, dr below 2651 ft.

GUADALUPE COUNTY—Kallison's Ranft 1, Burnham sur, mim. Spiller's Wright 1, Cottle sur, dr 605 ft.

KENDALL COUNTY—Landon & Holifield's Sidensticker 1, Rodriguez sur, dr below 910 ft.

MAVERICK COUNTY—Wellington's Chittim 1, sec 129, dr below 3805 ft; Chittim A-1, sec 156, dr 2701 ft.

MEDINA COUNTY—Trentman & Merrit's Carle 1, sur 72½, sd for repairs at 525 ft.

MILAM COUNTY—Tuxedo's Graves 1, Robertson sur, sd below 900 ft.

TRAVIS COUNTY—Smith's Morell 1, Winburn sur, dr 608 ft.

UVALDE COUNTY — Wilcox's Morris 1, Carrillo sur, dr chalk 1793 ft.

WILLIAMSON COUNTY—Aldridge's Kroschewsky 1, Parrass sur, dr 980 ft.

TEXAS GULF COAST

BRAZORIA COUNTY — Pure's Smith 1, Peach Point area, S. F. Austin sur, reaming 9830 ft, heaving shale; same operator's State Prison Farms 1, S. F. Austin sur, woc 1955 ft.

CHAMBERS COUNTY—A. A. Cameron's White 1, Canada Ranch area, S. Brill sur, dk. Laverne Decker's Broussard Trust 1, Double Gum Bayou area, H&TC No. 30, lcn. Salt Dome & Standard of Texas' State 1, in Galveston Bay, comp 647 bbls daily, 6030 ft.

GALVESTON COUNTY—Sun's Cade & Co. 1, Bolivar prospect, A. Dickson sur, dredging canal.

GRIMES COUNTY—Hubert Holt et al's Greer 1, Carlos area, P. B. O'Conner sur, dr shale 2210 ft.

HARRIS COUNTY—W. S. Howell's Root 1, Battleground area, A. McCormick sur, sd 2800 ft. Humble's Rohlf 1, n of Crosby, J. Sellers sur, dr shale 8101 ft.

JEFFERSON COUNTY — J. E. Harwell's State 1, in Gulf of Mexico, sd 3700 ft. Humble-McFaddin-State 1, in Gulf of Mexico, driving piling Glenn H. McCarthy's Broussard Trust 1, Cheek area, C. Hillbrandt sur, making oil and salt water 7725 ft.

MATAGORDA COUNTY — Pierce Estate's Fee 1, n of Van Vleck, I&GN sur, swabbing 6619 ft. Sun's Robbins 1, n of Citrus Grove, C. H. Vandeveer sur, coring shale 9708 ft.

TRINITY COUNTY—Gossage & Thompson's Thompson 1, n of Trinity, J. Hickey sur, dr shale 3017 ft.

WHARTON COUNTY—Strake's Strunk 1, Lissie area, L. P. Jennings sur, abn 9500 ft.

Ventilators

The Swartwout Company, Cleveland, Ohio, in a recently published Bulletin No. 205, shows many actual installations of ventilators in addition to various dimension tables and other technical data.

Valves

Hancock Valve Division, Manning, Maxwell & Moore, Incorporated, Bridgeport, Connecticut, has just issued an illustrated four-page Bulletin No. 8500 on blow-off valves. The folder explains in detail the advantages of these valves and contains engineering data on the proper selection for various problems.

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Fine Gramma Grass, Living water—Hunting, Fishing. Several Choice Locations. Improved and Unimproved, 200 acres to 100,000 acres. Full particulars.
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NEW PRODUCTS FOR THE FIELD
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HOSE AND BELTS
Thermoid Company

Thermoid Company, Trenton, New Jersey, recently announced three new additions to its line of rubber products, which may be described as follows:

Thermoid Tank Truck Hose has a molded and braided construction and is recommended for loading and unloading distillates, fuel oils, etc., in tank truck service. It is extremely flexible for a heavy hose and both the tube and cover are highly oil resistant. It is furnished in any lengths up to 250 feet in 1, 1¼, 1½, and 2-inch sizes.

Thermoid Gasoline Hose is constructed with specially compounded Neoprene tube to resist the softening action of gasoline. A special cover stock resists checking action of the sun. It is built with a high carbon steel wire woven into the carcass, providing strength to resist crushing and flexibility to withstand twisting without kinking.

Thermoid V Belts are made of a special construction which gives a "shock-absorbing" action and eliminates practically all belt stretch. Extra high tensile cords and wear-resisting cover are used.

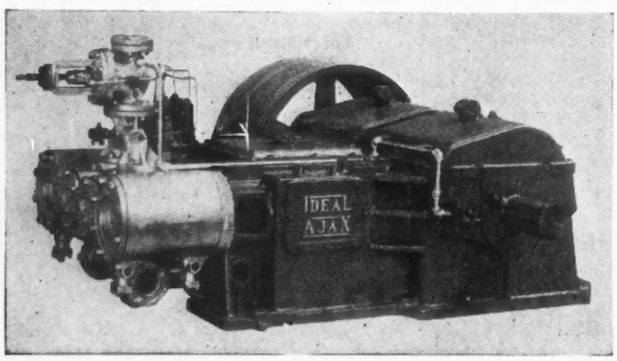
ROLLER BEARING STEAM ENGINE
The National Supply Company

The National Supply Company, Toledo, Ohio, and Ajax Iron Works, Corrie, Pennsylvania, recently announced the new Ideal-Ajax 10 x 10½ horizontal twin cylinder roller-bearing steam engine which has been designed to run at moderate and high speeds and built for heavy duty, continuous service. This engine is of two-throw, center-crank type with bored crosshead guides and with crank shaft running in tapered roller bearings.

The pump drive engines are regularly furnished to run "under" in order to give the proper rotation to the pump pinion shaft. The shaft is extended through both ends of the frame and the driving sheave or chain sprocket may be placed on either the right or left hand side. The shaft and bearings are of sufficient size and capacity to withstand the severe pulls encountered with slush pump drives. "V" belts offer the most efficient, quiet and compact means of transmission between the engine and pump. These belts are recommended on account of their ability to absorb shocks, their long service and their resistance to heat and moisture. Belt adjustment is obtained by slotting the bolt holes in the base of the skid carrying the engine portion, and adjusting screws are used to take up the tension.

Power pumps operated by the Ideal Ajax twin-cylinder engines can be operated at any desired speeds and the engines will "stall" against a heavy overload which could be caused by a plugged bit or any restricted circulation. To prevent an engine from over-speeding or running away, caused by a broken rotary hose or any other accident, the installation of an automatic, double cushioned combination throttle and engine stop valve is recommended. By means of a small, simple and positive shaft governor, which may be easily and quickly adjusted for any tripping speed, the engine throttle is closed by a steam trip pilot valve. From remote points the valve may be independently tripped or closed by means of an emergency steam pipe connection, if desired.

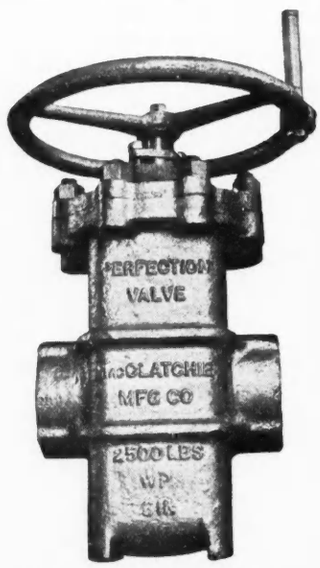
With the throttle valve handwheel the valve may be shut down tight or set in any desired throttling position without interfering in any manner with the automatic closing device. These valves are double extra heavy cast steel and are furnished with special valve, seat and trim for superheat. The valves are not furnished as standard equipment with pump drive engines. No other valve is required when the automatic throttle and engine stop valve is employed.



New Ajax Steam Engine

GATE VALVE
MacClatchie Manufacturing Company

MacClatchie Manufacturing Company, Compton, California, has developed a new valve, known as the Perfection Gate Valve, which is built on an entirely new principle wherein the sliding member is split vertically, to form two parts. In opening and closing the valve there is ample clearance between sliding member and body to allow free frictionless operation. At the bottom and top of the stroke, however, built-in pawls cause the two valve segments to expand against the walls of the valve, completely sealing off the clearance space so that dirt, sediment, and scale cannot enter. The operation is automatic and absolutely positive.



MacClatchie Perfection Gate Valve

Another performance point of the gate valve is that in the open position there is a full sized opening through the valve. This feature means not only unrestricted fluid flow, but also longer valve wear due to the elimination of the "jetting action" which occurs in conventional valves as the fluid velocity speeds up through the constricted opening. This jetting action causes rapid wear through increased abrasion, especially when sand is present.

The Perfection Valve is self-lubricated, containing space for sufficient grease to lubricate it throughout its life. This feature assures friction-free operation and complete protection of the valve mechanism from both wear and corrosion. The valve is made in 750, 1500 and 3000 pounds pressure models in a wide range of sizes.

DUPLEX POWER PUMPS
Fairbanks-Morse & Company

Fairbanks-Morse & Company, 900 South Wabash Avenue, Chicago, Illinois, announces a new line of duplex power pumps having eight-cover side-pot type fluid ends and enclosed, self-oiling power ends with herringbone gears and large roller bearings.

These pumps were designed to meet every requirement for pumping water, oil or other free-flowing liquids in quantities up to 187 g.p.m. and at pressures up to 1000 pounds per square inch. They are available as basic pumps, with pulleys for belt drive, or as complete, compact F-M motor-driven pumps covered by a single manufacturer's guaranty.

Quiet, efficient herringbone gears insure a smooth flow

NO ALIBIS NEEDED

Tool joints lead a hard life, both on the derrick floor and in the hole. But that is never accepted as an alibi for poor performance.

Tool joints made from Chrome-Moly (S.A.E. 4140) steel never require alibis. They are tough, strong, and have good fatigue-strength. Their hardness keeps them from galling easily, and makes them resistant to abrasion and erosion.

Chrome-Moly tool joints are just one example of how Molybdenum steels are saving time and money in oil production. Detailed information about them is given in our book, "Molybdenum in Steel," which will be sent on request. Climax Molybdenum Company, 500 Fifth Avenue, New York City.

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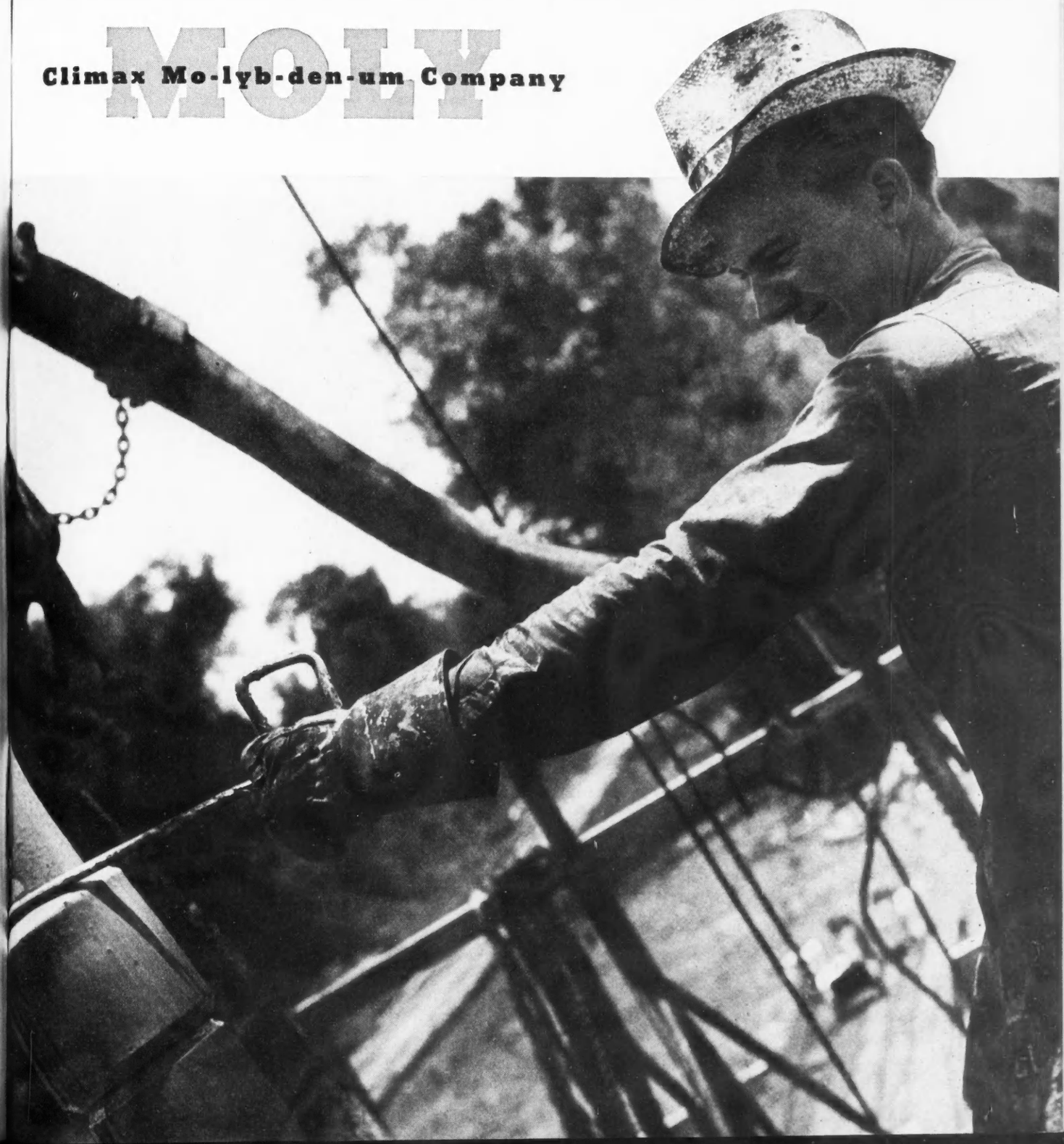
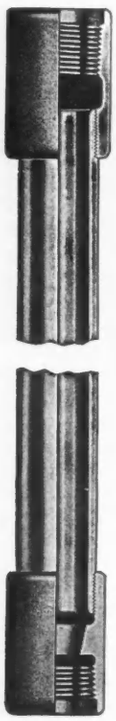


A SPECIALIZED WORKING BARREL FOR EVERY SERVICE



Select your Working Barrels for the service required! Hough offers you three *specialized* types—Seamless Steel, Cast Iron, and Seamless Bronze. Each one will give you long, efficient service.

Your oil-field distributor carries Hough Oil Well Specialties in stock. They are designed to *reduce pumping costs!*

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A Buckeye DITCHER for TRENCH 10" to 22" WIDE

• OVERALL WIDTH OF MACHINE ONLY 52"
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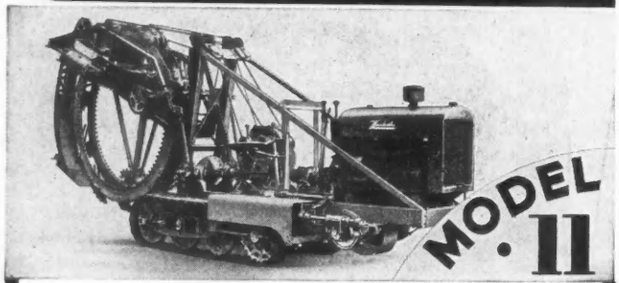
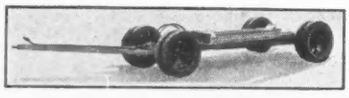
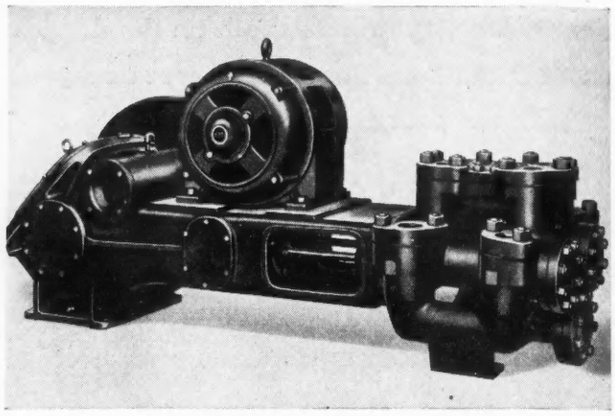


Big ditcher efficiency and economy comes to the small ditching field in the Buckeye Model 11. Built for steady, time saving operation, with speed for easy going and rugged strength for the toughest jobs – features of Buckeye engineering that always save you money on any job. Before you buy a ditcher, be sure you have the facts about Model 11.



This specially designed Buckeye trailer is for quick and easy transportation of the Model 11. The ditcher climbs onto the trailer under its own power, fully assembled.

THE BUCKEYE TRACTION DITCHER CO., FINDLAY, OHIO



Fairbanks-Morse Duplex Power Pump

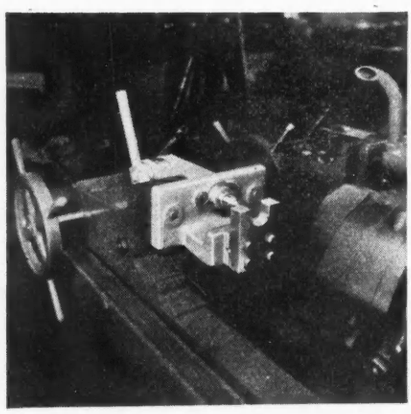
of power, with little vibration, from power end to fluid end. Generous crank-shaft and pinion-shaft roller bearings reduce mechanical friction to a minimum. The self-oiling construction employed in the power end assures positive lubrication of all gears, connecting-rod bearings and crossheads. There is sufficient space between the two removable-gland type stuffing boxes so that there is easy access for inspection or servicing, and so that no part of the piston rod enters both stuffing boxes, preventing oil from entering the fluid end and water from entering the power end.

SPECIAL WORK HOLDING FIXTURE

Landis Machine Company

Landis Machine Company, Waynesboro, Pennsylvania, recently placed on the market a special work holding fixture which has been designed for use on the Landmaco threading machine and which provides an efficient and rapid method of accurately locating the work to assure perfect concentricity between the thread and the work.

This attachment consists of a special traveling center, a driving block and a locking center. The traveling center is located in the bore of the head to support the front end of the work, and eliminate any possibility of the chasers leading off center. A long heavy spring, also in the bore of the die head spindle, maintains a constant pressure of the center against the work.



Landis special work holding fixture for threading machine

When used in production, the work is first located on the traveling center, then dropped into the steel block on the carriage. The cam handle is then pushed forward causing the locking center to engage in the work and push it forward until a shoulder on the work rests against the back surface of the driving block.

Since the cam imparts a slow movement to the center spindle, a positive locking action is attained the instant the work strikes the driving block. Adjustment is provided in that part of the attachment located on the carriage, to permit both horizontal and vertical alignment of the locking center, to the center of rotation of the die head.

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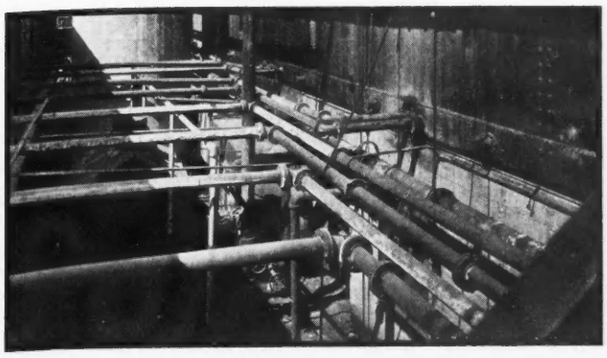

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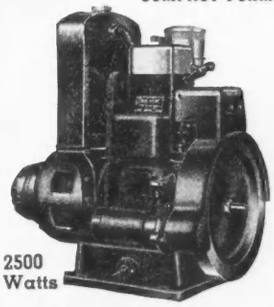

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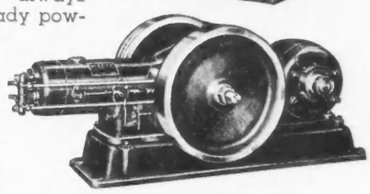
Manually started vertical Dieselectric Plants 1500 and 2500 watts. Horizontal manually started Dieselectric Plants 4000 and 8000 watts. Here is Diesel power in its smallest, most compact form, incorporating every advanced feature of modern engineering.



4000 and 8000 Watts

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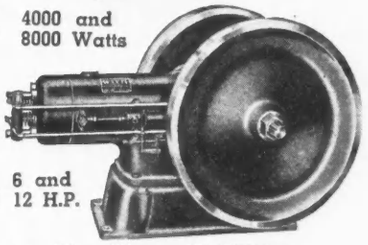

6 and 12 H.P.

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Drop-forged from improved quality carbon steel and specially processed to Williams' exacting specifications, "Superior" Wrenches average *93% as strong as Alloy Steel Wrenches of similar size.* They are actually stronger than the Double Head Engineers' Pattern alloy wrenches which are of popular thin design. They cost considerably less! They provide a better hand grip than the usual thin alloy wrench . . . they insure greater and safer bearing on the nut. Make your next wrenches Williams' "Superiors" . . . . 50 patterns, over 1000 sizes.

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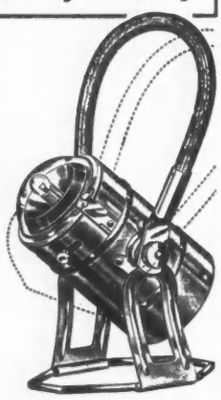
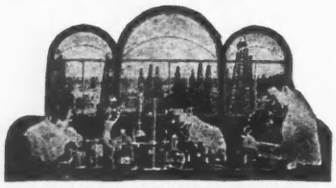
Nothing novel—no bunk—but it gets the job done without scoring brake rims. See page 1940, Composite Catalog.
STANDARD BRAKE LINING CO.

ECOLITE is Safe, Sturdy Always Ready

Ecolite 44 U.S.V. is approved by Underwriters' Laboratories and 90% of major oil companies have standardized on this safe, dependable, electric lantern. It is supreme in the oil business.
ECONOMY ELECTRIC LANTERN CO., Inc.
325 W. HURON ST., CHICAGO, ILL.
AVAILABLE AT SUPPLY STORES
ECOLITE
IT PIVOTS—TILTS—FOCUSES

GEOPHYSICAL SOIL SURVEYS
PERHAPS YOU SHOULD KNOW:
1. That more major concerns use this company's GEOPHYSICAL SERVICE for locating oil than perhaps any other one concern.
2. That although our mistakes are sometimes serious, yet:
3. We can accurately record structural accelerations 5 out of 6 times, and
4. Oil, possibly 6 out of 10 times.
5. By chemical analysis of surface soils.


GEOLOGICAL SCIENTIFIC SERVICE CO.
PETROLEUM BLDG.
FT. WORTH TEXAS
NOTICE: Why Write?
There may be a Field Crew Manager or Traveling Representative already in your vicinity who will courteously answer your questions. He will be in your office in a few hours
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CALLING COLLECT
STATION TO STATION
2-9888 FT. WORTH, TEXAS
and telling the girl your name and address
(Calls accepted from anywhere on earth)

This Week with the Industry's EQUIPMENT SUPPLIERS

Parkersburg Rig & Reel Company Distributor for Smith Separators

The Parkersburg Rig & Reel Company, Parkersburg, West Virginia, became exclusive distributor of Smith separators on January 1 of this year, and recently announced plans calling for improvement in the distribution and servicing of this well known line.

At present, stocks and service are available in Houston, Corpus Christi, Odessa, Willow Springs, and Pampa, Texas, and Rodessa, Louisiana. Within the near future, stocks and service will also be made available at convenient points in Kansas and California. Thereafter as conditions justify, they will be added at other desirable points in Parkersburg nation-wide warehouse system. Fields in Oklahoma are to be handled direct from the Smith plant in Tulsa.

Company Organized to Make Drilling Specialties at Houston

Oil Well Engineering Company, Inc., with headquarters in Houston, has been organized to manufacture and service a new line of drilling specialties, with James D. Hughes as president, Vann Wilson, vice president, and Guy Brown, secretary-treasurer.

Dallas Belting Company Fills Order In Record Time

Dallas Belting Company, distributors for Diamond Mechanical Division of The B. F. Goodrich Company, Akron, Ohio, recently reported a seemingly impossible order received from a large oil company. The order placed, called for a dozen 14-inch 7-ply endless Lynx belts, 93½ feet long, to be delivered within 24 hours.

Employing the Plylock splice, which makes belts endless either on the pulleys or in the shop, permitted delivery of this order in the specified short time.

Jarecki Manufacturing Company in New Chase Store After Fire

The Jarecki Manufacturing Company, whose Chase, Kansas, store burned recently, is doing business again in a new building on the old location, with an entirely new stock. Paul Warmbrodt is manager of the Chase store.

Dunigan Tool & Supply Company Opens Offices at Fort Worth

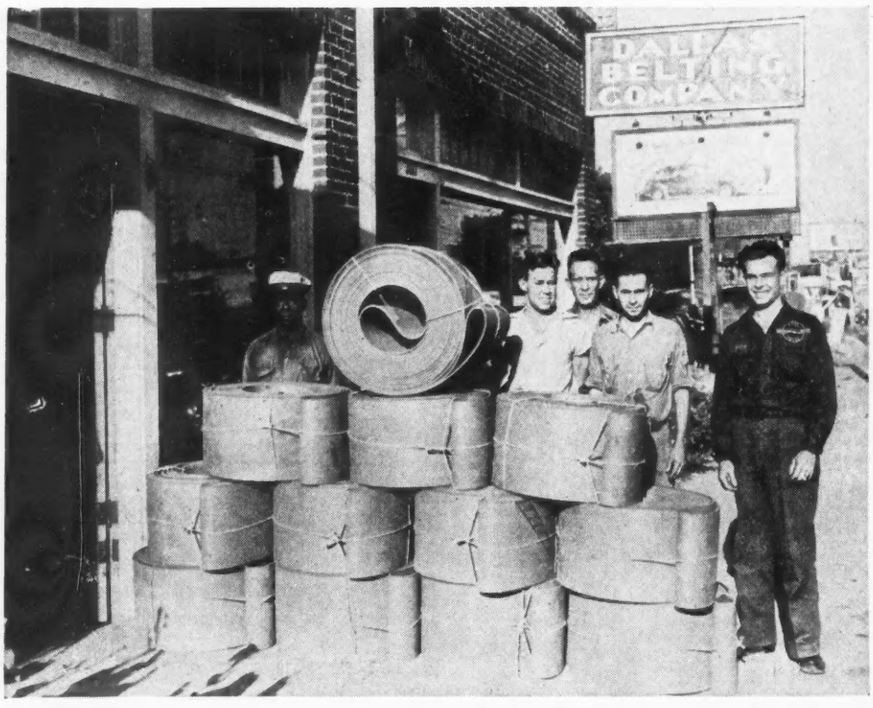
Dunigan Tool & Supply Company of Breckenridge, Texas, announces the opening of an office in Fort Worth, in the Sinclair building. It will be in charge of J. B. Dunigan, president, and J. J. (Coz) Dunigan.

Macwhyte Company Holds National Sales Meeting

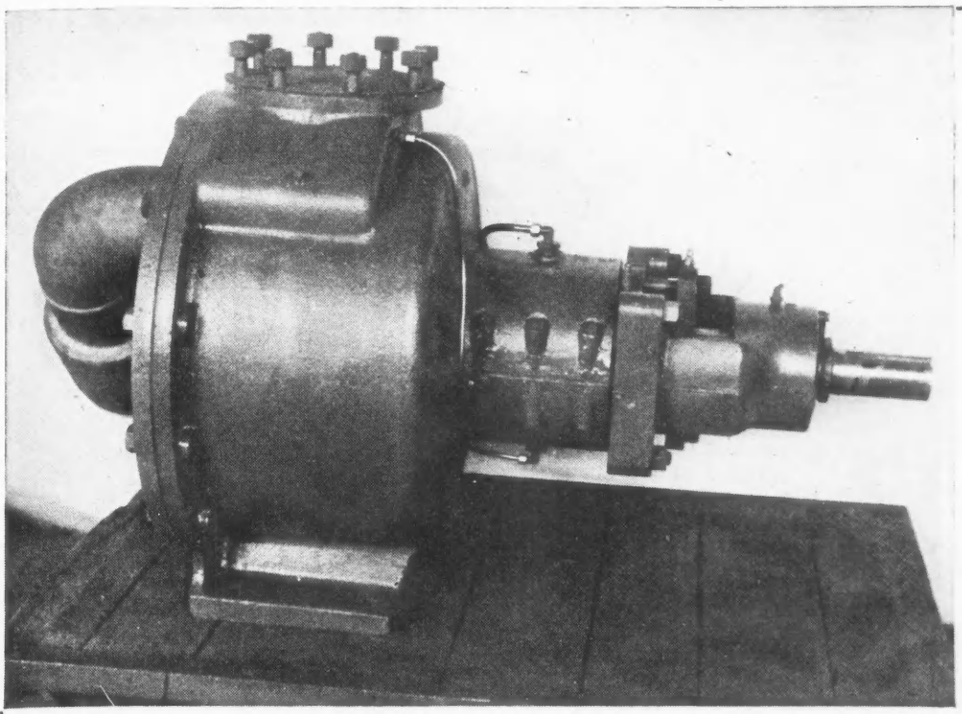
Macwhyte Company, Kenosha, Wisconsin, recently held its three-day national sales convention at the home office, which was attended by 26 salesmen of the company.

Representing every section of the United States, the salesmen spent the first of three convention days in the company's laboratory while rigid tests given all products were demonstrated and explained by Walter Bloxdorf, metallurgist.

Other conference highlights included an open forum discussion on sales prob-



Endless belt order delivered by Dallas Belting Company in record time.



VIKING
IMPROVED PUMP

Especially Designed for Tanker and Barge Service

This pump is a modified Model ER, for handling crude oil or refined liquids, having a 6" suction and a 6" discharge, and a capacity of 750 gallons per minute at 200 rpm. Full details available upon request.

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DISTRIBUTED BY

SOUTHERN ENGINE & PUMP COMPANY

HOUSTON, DALLAS AND KILGORE, TEXAS

WHEN NIGHT FALLS

You'll Like

THE WARMTH AND CHEER ABOUT THE

PITTSBURGHER

Steel City's Newest Hotel

All rooms have radio at no extra cost, outside view & bath.

MUST BE A GOOD HOTEL TO BE SO POPULAR

RATES: Single Occupancy . . . . $3.00 to $4.00
Double Occupancy . . . . $4.50 to $6.00

Only Hotel in Pittsburgh with Radio in Every Room

THE HOTEL PITTSBURGHER

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SECONDARY RECOVERY ENGINEERING

AIR & GAS REPRESSURING
WATER FLOODING
WHEREVER SUITABLE

PRELIMINARY ANALYSES
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PETROLEUM ENGINEERS

BRADFORD PENNSYLVANIA

lems in which all salesmen participated; a discussion of wire rope service, by President Jessel S. Whyte; a review of sales accomplishments by H. E. Sawyer, general sales manager; and a discussion of markets and merchandising by A. B. Moseley, sales manager.

The conference closed with a banquet at which George S. Whyte, founder and board chairman of the company, presided. Whyte made some interesting and pointed comparisons of progress made in the manufacture of wire rope, and foresaw increased activity in the wire rope industry during the coming year.

Goodyear Rubber Men Celebrate Long Service

Twenty-fifth anniversary of the organization of Mechanical Goods Division of Goodyear Tire & Rubber Company, at Akron, Ohio, was celebrated in February with four outstanding veterans of the rubber industry who have been with the division since its inception, as guests of honor at a dinner signalizing the occasion.

The four veterans are W. M. "Pop" Metzler, 52 years in the rubber industry; Hal Campbell, with 43 years; D. R. Burr, 43 years, and R. R. "Pop" Peebles, 31 years. All four joined Goodyear in 1913 and have played important parts in building the company's Mechanical Goods Division to its present position of eminence in the industry.

Metzler, oldest man active in rubber manufacturing in the United States, is 77 and launched his career in the industry in 1886 with Goodrich, where he worked successively at curing bicycle tires, as a compounder, as manager of the crude rubber department and in charge of receiving compounds and washing rubber. He left Goodrich in 1892 to join Eastern Rubber Company of Trenton, New Jersey, as superintendent. He returned to Akron in 1897 to be assistant superintendent for The Diamond Rubber Company. One year after the Diamond-Goodrich merger in 1912 Metzler joined Goodyear as production superintendent for the new Mechanical Goods Division. He has been a consulting engineer with Goodyear since 1917.

Campbell is 61, also started with Goodrich, in 1895, in drug sundries. He installed the belt room of Republic Rubber in 1901 and had charge until 1908 when he went to Atlas as superintendent. He worked with Goodyear a short period in 1910-1911, with Lee in 1912 and, in 1913, returned to Goodyear in the solid tire department, later worked in efficiency. Today he is a division superintendent of mechanical goods.

Burr's initial experience was gained with Kilborn & Jacobs, mill supply and mechanical goods jobbers, formerly of Columbus, Ohio, beginning in 1894, at the age of 21. This was followed by four years as an independent jobber of mechanical rubber goods. In 1905 Burr joined Diamond with the sales department, in 1906 was placed in charge of western sales for that company, headquartering at Chicago.

In 1913 he came to Goodyear and took charge of the Chicago office for mechanical goods sales, in 1916 returned to Akron as assistant manager under the late I. R. Bailey. In 1918 and 1919 he was assigned temporarily to the Export Division to establish a sales setup for mechanical goods in Australia and New Zealand. He returned to post of assistant manager at Akron in 1919, in 1920 was made manager of the department. Since 1933 he has been consulting manager.

Peebles, who is 69, joined Diamond as assistant to the sales manager in 1907 following 16 years of experience as superintendent, first with Falls Rivet & Machinery Company and later with Turner, Vaughn & Taylor, both of which concerns were manufacturers of rubber machinery and various other kinds of equipment.

In 1910 he was made mechanical goods division sales manager for Diamond at Detroit. In 1913 he resigned and joined Goodyear, becoming sales manager for the Central Division, headquartering at Detroit. In 1919 he was placed in charge of the Cleveland district. In 1922 he was sent to England to lay the groundwork for establishment of Goodyear's mechanical goods manufacturing and sales setups in that country. In 1925 when Cleveland district was transferred to Akron, Peebles was placed in charge of the eastern division. Since 1931 he has been manager of the matting, packing and molded goods sales.

Goodyear has manufactured mechanical rubber goods in its Bowmanville, Ont., plant since 1909, but did not establish its American operations until 1913.

Wilson Manufacturing Company Transfers Representative

Wilson Manufacturing Company, Wichita Falls, Texas, recently announced the appointment of Guy E. Daniels as export representative for the company.

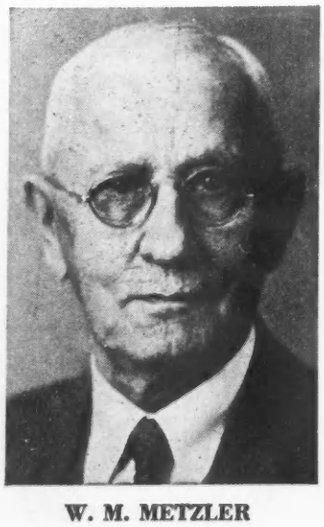
Transfers of field representatives also have been made within the organization.

Guy E. Daniels, Export Representative for Wilson Manufacturing Company

J. V. Wintle has been placed in charge of sales activities of Oklahoma and Kansas, with headquarters at Tulsa. Russell Moore, formerly sales representative for the West Texas district, has been transferred to Houston.

Texas Electric Steel Casting Company Expands Facilities

Texas Electric Steel Casting Company, Houston, began an expansion program early in February which will double the capacity of the plant's steel casting output. Included in this expansion program is the addition of 160 feet to the building, which increases the floor space by 8320 square feet; a 1½-ton electric furnace, an electric crane, an annealing furnace, additional core ovens, and other necessary equipment in keeping with this class of expansion. All equipment has been purchased, and construction is being rushed to completion to take care of the increased volume of business the foundry has contracted.



W. M. METZLER

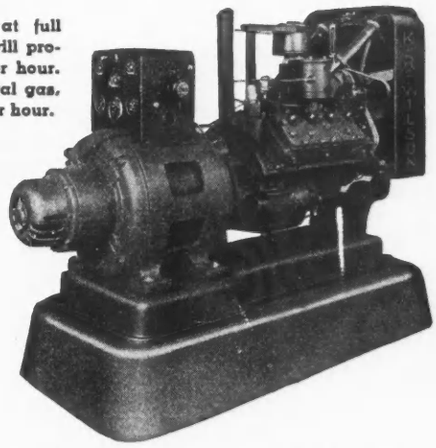
R. R. PEEBLES

H. E. CAMPBELL

D. R. BURR

KRW-FORD V8 ELECTRIC PLANT

This Unit, operating at full load on 10c gasoline will produce 20 KW for 45c per hour. Operating on 30c natural gas, 16 KW costs only 13c per hour.



PRODUCES BOTH 110 AND 220 VOLT CURRENT FOR LIGHT AND POWER

20,000 WATT CAPACITY

Operates at 1800 R.P.M.

Powered with brand new **Ford V-8 85 H.P.** engine, with light weight steel pistons and cast iron heads—Six-blade, 19" Fan with double belt drive—**Ford Air Filter** with crank case ventilator—**Battery, Starter, Generator—Temperature Gauge** and **Temperature Control** which breaks ignition circuit if water temperature exceeds 200 degrees—Bus size **Fram Oil Rectifier** saves 75% of lubrication costs, insures long engine life—Improved **Pierce Governor** with double "V" belt drive.

Generator is of special design and extremely efficient. Armature is perfectly balanced and runs on large, heavy duty, Ball Bearings—**Exciter** is built-in. (3 Phase, also DC if desired). Cast Aluminum **Instrument Panel** includes **Tachometer—Oil Pressure** and **Oil Temperature Gauges—Ignition Switch Lock**—Starter **Push Button**—Hand **Rheostat** for generator control.

For complete information, prices and data write us. You can buy through your local Ford Dealer and benefit by local service and low-cost Ford engine replacement feature.

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Builders of Shop Equipment for Ford Dealers Since 1916
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Sparkling with its modern splendour, inside and outside, a completely new hotel. Furnishings and decorations styled for tomorrow. Rooms and suites, all with circulating ice water, and private lavatory, toilet and bath.

Hotel SOUTHLAND

IN THE HEART OF DALLAS TEXAS

RATES $1.50 TO $3.

JOE M. HALLAMAN
MANAGER

AIR CONDITIONED FOR YEAR 'ROUND COMFORT

PATENTED

RESISTS OIL and HEAT!

THE KLOZURE OIL SEAL effectively *resists oil and heat*—keeps oil and grease in the bearing—and keeps dust and dirt out! Tough and durable; gives long, uniform performance. Special designs when required—all sizes; write for catalog.

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KLOZURE

IN WORLD WIDE USE MILLER

MORE MILLER'S ARE USED IN CLEANING-OUT THAN ALL OTHER SAND PUMPS MADE

The Reason

IS BUILT INTO

The MILLER

● The RESULT is oil in your tanks in place of sand in your well. Get FULL production from your wells. CLEAN-OUT with a MILLER.

The MILLER is made in diameters of 2½, 3, 3½, 4, 4¼, 5, 5½, 7 and 9 inches and lengths of 20, 25 and 30 feet. 5/32-inch wall thickness in REGULAR Type, ¼-inch wall tubes HEAVY Type Sand Pumps.

INTERCHANGEABLE BOTTOMS
To Meet Every Condition

● BAILER BOTTOM
With the Bailer Bottom installed the MILLER is quickly changed to a Bailer giving you a combination of either Bailer or a Sand Pump in one tool.

● SAND BOTTOM
Used when tools are run and when well is shot to quickly remove loose material.

● STAR BOTTOM
Used for cutting the sand loose.

● CHISEL BOTTOM
(In Pump)
With this bottom tightly packed sand can be easily broken in small pieces so it can be picked up in the pump.

Write for Descriptive Folder and Price List

See Page 1186 COMPOSITE CATALOG

PATENTED
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NO. 2033667

MILLER Sand Pump Co.

General Offices and Shop, Box 4516
OKLAHOMA CITY, OKLA., U. S. A.

Branch Shops and Offices:
SAPULPA, OKLA. and KILGORE, TEX.

FOR SALE BY SUPPLY STORES EVERYWHERE

Squeaks from the Bull Wheel

The Novice

It was the first time she had been to dinner with them, and they smiled indulgently as she refused a whisky and soda.

"I've never touched it in my life," she explained.

"Why not try it?" urged her host. "See if you like the taste."

She blushed and shyly consented, and he poured her out a mixture which she delicately raised to her lips.

"Why," she cried, "you've given me Scotch!"

Aha!

The head of the firm was frowning over a letter. Calling for his chief clerk, he said: "That typist—you certainly didn't engage her on account of her grammar."

"Grammar?" said the other, "When you were emphasizing the importance of grammar—well, I thought you said 'glamour'!"

Lost in the Void

"Yes, the bullet struck my head, went careening into space, and—"

"How terrible! Did they get it out?"

Uncertain

"Do you think the new cook is going to settle down with us, dear?"

"I'm a bit doubtful, darling. A letter came for her this morning and the envelope was readdressed five times."

Miaow!

The two were having tea, and among the topics of conversataion was burglary.

"I always feel safe when there's a man in the house," remarked the brunette.

"I don't see why you shouldn't, dear," purred the blonde.

And the Cock Did Crow

The speaker was in the midst of an eloquent talk when some wag in the audience crowed like a cock. It was done to perfection and the audience was convulsed with laughter. The great orator's friends felt uneasy as to his reception of the interruption.

But the speaker stood perfectly calm. He stopped speaking, listened till the crowing ceased and while the audience was laughing he looked at his watch. Then he said:

"That's strange. My watch says it is only ten o'clock. But there can't be any mistake about it. It must be morning, for the instincts of the lower animals are absolutely infallible."

And Still the Wonder Grew

He was explaining exactly why the bank rate stood at its present figure, why the economic recession existed and how it could be cured. His wife sat by listening with admiration in her eyes. At last she said:

"It seems wonderful that anyone could know so much about money as you do without having any."

Back in Circulation

Sandy called a doctor over the telephone. "Come quick," he said. "My wee bairn has swallowed a six-pence."

"How old is it?"

"1894."

Not an Advertiser

Fiddledee was very disappointed with the report of his recital printed in the local paper.

"I told you three times," he complained to the owner of the paper, "that the instrument I used was a genuine Stradivarius, and in this story there was not a word about it."

"That is as it should be. When the Stradivarius Company advertise their fiddles in my paper you can come round and tell me about it."

Daily Good Deed

"Listen! I hear my husband coming. Please save him from the electric chair."

"How?"

"Jump through that window, and run like the devil."

Cheated

"I'll have you know I got my education at Harvard."

"Indeed? Why don't you sue 'em?"

Fair Warning

He—"I'm a bank examiner."
She—"Well, I'm no bank."

Vegetarians

"I say, waiter, the flowers on this table are artificial, aren't they?"

"Yes, sir. That's the worst of running a vegetarian restaurant—if we use real flowers, the customers eat them."

Reward

"What did the Roman soldiers sometimes receive as a reward for bravery?"

"Property."

"Give an example."

"Horatius kept the bridge."

Advance Lesson

The bright young thing came into the room and smiled at her mother.

"Mother," she said, "I must have some money for a new dress. Will you ask daddy for it?"

"Ask him yourself, dear," was mother's reply. "You are getting married in a month's time and you must have some practice."

A Visible Change

The Irish policeman on point-duty signaled Jones to come on; but just as Jones accelerated, another car shot out from a side-street and the two collided. The constable came over to Jones.

"What's all this?" he demanded.

"I'm sorry," Jones replied, "but I could have sworn you signaled me to come on."

"Arrah, don't talk nonsense, man!" he shouted. "Did ye not see me changin' me mind."